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ARTICLE II.

Observations on the Nāiades ; and Descriptions of New Species of that, and other Families. By Isaac Lea. Read before the American Philosophical Society March 16, 1832.

PRELIMINARY REMARKS.

IN presenting myself again before the Society with a new memoir in that department of conchology which has so much engaged my attention for some years, an apology would seem almost necessary. My zeal and love for the science generally will, I trust, be sufficient for my present intrusion on its time.

The family *Nāiades* seems to have excited very little interest with the older writers on natural history, and not much more among modern zoologists until within the present century.

The progress of general knowledge, and the improvements in the mechanic arts, have recently been greatly accelerated, and the discoveries and improvements in the study of natural science, have gone on “*pari passu*” with them ; and we have every reason to believe that the momentum which they have acquired will not be diminished, for, to use the words of one of the most successful writers of the present day, “there is growing up an enlightened public opinion” which no power is likely to arrest, and which must carry us far towards a perfect state

of knowledge, while there is such a "diffusion of existing knowledge among the mass of mankind" as we have at present.

We can only account for the almost total neglect of the family *Naiades* by writers on natural history of the last century, in the fact that the fresh waters of Europe produce so few species that they had then scarcely attracted attention. The habits of these animals have been there so little studied and known, that some recent writers of reputation assert that they move with the beaks of the shell "downward," which is equivalent to saying they walk on their backs. The *anterior* part has been called the *posterior* part, which is as much as to say, that their locomotion is backward.

These facts display a great want of attention to the animal in its element,—where it would be observed to possess many curious and striking characteristics. The great systematist, the immortal Linneus, whose name will be found recorded in the book of the last student of natural history, knew so few members of this family that he classed them indiscriminately with two *marine genera*, *Mya* and *Mytilus*.

It was the rich and splendid productions of the rivers of the United States, and particularly those which are tributary to the Mississippi, which first roused the attention of the zoologist to their extraordinary characters; and they have within a few years become sought after by collectors as eagerly as the "most precious jewels of the ocean."

Urged by the solicitations of numerous scientific friends, I have continued my efforts to obtain such specimens as appeared to me to be new and undescribed, and they are now submitted to the consideration of the Society.

In my communications I have heretofore said little on the geographical position of our *Naiades*. It has, however, been to me an interesting branch of the subject, and engaged much of my attention. The great dividing ridge or chain of mountains, the Alleghanies, which seems so completely to separate our eastern from our western waters, almost as completely separates the species of this family inhabiting those parts lying east and west of it. It is a matter of doubt if there be more than two or three species of all the genera of this family existing in the eastern waters which have their analogues in the western waters. That shell, which we have considered the *Unio cariosus* of

the Ohio, certainly has a different aspect from that of our eastern rivers, and might with great propriety be referred to the name which Mr Say gave it long since, viz. *U. crassus*.* There is another shell, however, in the Ohio, which has a stronger resemblance than this, and I believe it to be the analogue of the *Alasmodonta marginata* (Say). I have examined numerous specimens of this species frequently and attentively, but cannot distinguish any difference except in the size, the western shell being generally much larger. Of the numerous species and genera of the families *Lymneana*, *Melaniana* and *Peristomiana*, I have never seen a single species common to both waters. To the genus *Cyclas* I have given but little attention, but believe the same observations may be extended to this species.

What an interesting field do these facts spread open to the inquiring philosopher! Why should the streams which flow down the sides of the same range of mountains, east and west, differ so essentially in their productions?

Let us now examine the extremities of this great chain. To the north, where it is lost in the high lands which spread out along the southern boundaries of the small lakes in the state of New York, great difficulty naturally occurs in defining the line of separation. So far as my observation has extended, the shells of the river Mohawk and its tributaries are the same with those of the Delaware, Potomac, &c. with the exception of a single species *Symphynota compressa* (nobis), which is found near Albany, and which exists also in the Ohio. The tributaries of the lakes Erie, Michigan, &c., with few exceptions, produce the western species, and consequently the lakes do also.†

The great river Niagara, or rather strait connecting the lakes Erie and Ontario, furnishes us with the *U. triangularis* (Barnes), and other species, which are so peculiarly characteristic of our western waters. Never having visited the shores of lake Ontario, I cannot pronounce on its productions. The shells of the river St Lawrence are, I believe,

* A shell which I have always considered as a truncated variety of *U. crassus* of the Ohio, has by this naturalist been made a new species under the name of *U. abruptus*.

† Since writing the above I have received the *U. complanatus* (Soland.) from Lac Vaseux, which empties into Green Bay; and more recently the same species from lake Champlain. The *U. nasutus* (Say) has been observed in Grand river, which disembogues into lake Erie.

impressed with the character of those of the lake. In this river there is, however, little to my knowledge interesting to the conchologist.

Lake Champlain, which empties its waters into the St Lawrence, is prolific in some of the western species. The *Symphynota alata*, the *Unio occidentalis* and the *Unio rectus*, with some other western species, are found there in great perfection, but none of the tuberculated or undulated species.

The southern extremity of the Alleghany ridge is supposed to reach into the upper part of the state of Alabama, where it terminates by spreading out into high lands east of the river Tennessee, and near to that part where the river makes its most eastern angle. The sources of the Alabama and Tombeckbee rivers, which discharge themselves into the Gulf of Mexico, are situated in these high lands, and the character of the shells of these rivers is completely the same with those of the western waters. In no instance have I observed a shell from these rivers, or the Mississippi, which possessed the characters of those of our eastern rivers. To draw the exact line of distinction here, in the present state of our knowledge, is impossible; but that such a line does exist there can scarcely be a doubt.

The great difficulty experienced by naturalists in procuring specimens from newly settled and distant parts of the United States is such, as to deprive us of much desirable information. This impediment will, it is hoped, be overcome in time, and the natural history of our country become universally known.

In the present state of our knowledge, we can only place this line somewhere between the Alabama and the Altamaha rivers. From the latter, I have seen but a single valve, which I owe to the kindness of Mr Nuttall. This is the *U. complanatus* (Soland.), and marks distinctly the character of the shells of this river to appertain to that of the eastern waters. From the river Appalachicola I have never been able to procure a single specimen, and it remains yet to be proved whether it produces shells of the eastern or western character. As, however, it disembogues in the Gulf of Mexico, it is more than probable that it possesses the same species as the western waters, and its neighbour the Alabama.

In regard to the shells of the soil, it will naturally be asked if they

also differ so completely as those of the rivers on the two sides of the great ridge? In these the distinction does not exist, for we find almost every species which is common on the eastern, equally common on the western side. There are, however, some species which are not uncommon on the western side, but which do not exist, so far as my information extends, on this side. If it be demanded why the line of demarcation should not be as perfect for terrestrial as fluviatile shells, we might say in answer, that the barrier of a mountain could in time be overcome even by the slowly travelling snail. Surely in the lapse of time the progeny of those which accidentally began to climb the steeps, might descend into the valleys of the opposite side.

In finishing these introductory remarks, I wish to call the attention of those naturalists who are conveniently located, to make further observations on this branch of the science, which certainly has great interest.

In describing the *Valvata arenifera* in my last memoir, Vol. IV. page 104, I was impressed with the idea, from the circumstance of finding a true operculum combined with a spiral tube, that the animal must have belonged to the family *Peristomiana*. I have reason, however, since, to doubt the truth of my conclusions. Professor Troost, now at Nashville, Tennessee, originally sent the specimens from that neighbourhood; and from his description of the animal, which he has recently communicated to me, I am induced to believe it to be a species of Linnean *Phrygania*.

UNIO NICKLINIANUS. Plate I. fig. 1.

Testâ subtrigonâ, inæquilaterali, obliquâ, maxime undulatâ, usque ad natium apices; valvulis crassissimis; dentibus lateralibus crassis curvisque; cardinalibus maxime crassis; margaritâ albâ et iridescente.

Shell subtriangular, inequilateral, oblique, very much undulated, even to the point of the beak; valves very thick; cardinal teeth very thick; lateral teeth thick and curved; nacre pearly white and iridescent.

Hab. China.

My Cabinet.

Diam. 2,

Length 5,

Breadth 5·8 inches.

Shell subtriangular, oblique, very much spread out, with an elevated wing, flattened towards the beaks, the greatest diameter being near the posterior basal margin, covered with numerous undulations, except on the anterior and basal margins; undulations diverge from the beak, and are largest near the posterior margin: substance of the shell very thick in the region of the basal margin; beaks pointed but not elevated, covered with numerous beautiful lustrations to the very point; epidermis dark brown; cardinal teeth very large, thick and sulcate; lateral teeth thick and curved; anterior cicatrices rough and distinct; posterior cicatrices slight and confluent; dorsal cicatrices situated on the under side of the cardinal tooth; cavity of the beaks angular; nacre pearly white, very iridescent on the posterior part, where the undulations are visible from without.

Remarks.—I met with this very interesting species in the autumn of 1831 at a dealer's in New York. I was informed that it was supposed to be from China. A single valve only could be obtained, and this unfortunately not entirely perfect. The characters are, however, so distinct from any species I have seen, that I have not hesitated to give it a place among my new species. It is remarkable for its great extent from the top of the wing to the basal margin, and for its numerous undulations. In outline and diameter it resembles the *Symphynota complanata* (nobis) (*Alasmodonta complanata* of Barnes), but differs in being less transverse, higher in the wing, and more thickly covered

with undulations. In the possession of many folds, it resembles the *U. multiplicatus* (nobis), but differs in outline (being much less transverse), as well as in the size of the undulations, which are much smaller. The point of its greatest diameter is much nearer the posterior basal margin than in the *multiplicatus*. The imperfect state of this specimen has prevented me from describing the ligament. Judging from its elevated wing, I am much inclined to believe that when perfect specimens are procured they will be found to be connate. If so, it will belong to a natural division removed from *Unio*, viz. *Symphynota*. I have dedicated this fine species to my friend P. H. Nicklin, Esq., of Philadelphia.



UNIO CAPILLARIS. Plate II. fig. 2.

Testâ suborbiculatâ, ventricosâ, subæquilaterali, postice subangulatâ; valvulis subcrassis; natibus prominentibus; epidermide nitide rugatâ; radiis numerosis capillaribusque; dentibus cardinalibus valde elevatis; lateralibus lamellatis et sursum subreclivis; margaritâ albâ et iridescente.

Shell suborbicular, ventricose, subequilateral, subangular posteriorly; valves rather thick; beaks elevated; epidermis finely wrinkled; rays numerous and capillary; cardinal teeth much elevated; lateral teeth lamellar, and inclined to curve upwards; nacre pearly white and iridescent.

Hab. Ohio. T. G. Lea.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam 1·2, Length 1·5, Breadth 1·9 inches.

Shell suborbicular, ventricose, subequilateral, subangular posteriorly; substance of the shell rather thick anteriorly; thinner posteriorly; beaks thick and elevated; ligament short and thick; epidermis dark and finely wrinkled, smoother towards the beaks; rays numerous, capillary, and spreading over nearly the whole disk; cardinal teeth elevated, crenate, deeply cleft in the left valve, and rising from a pit in the right; lateral teeth lamellar, crenate, inclined to turn upwards; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cica-

trices situated on the under side of the cardinal tooth; cavity of the beaks obtusely angular; nacre pearly white and iridescent.

Remarks.—I have had a single specimen of this shell for some years, and although satisfied it differed from any described species, I deferred bringing it forward until I should have an opportunity of examining more. In the fine collection of the Academy of Natural Sciences I found a second specimen, which so completely coincided in all its characters with mine, that I deemed it unnecessary to hesitate erecting it into a species. Both the specimens have that enlargement of the inferior portion of the umbonial slope mentioned in the remarks on the *U. Haysianus* herein described, which usually causes a remarkable and curious denticulation of the margin, and a poverty of the deposition of the nacre in that region. It has, perhaps, a stronger resemblance to *U. ellipsis* (nobis) than to any other species. It is however more rotund, more minutely rayed, and less oblique.

UNIO SUBGLOBOSUS. Plate II. fig. 3.

Testâ subglobosâ, subæquilaterali, inflatâ et postice subangulatâ; valvulis crassis; natibus prominulis rotundatisque; dentibus cardinalibus latis striatisque, lateralibus subcurvis; margaritâ subrufâ, vel colore caryophylli tinctâ.

Shell subglobose, nearly equilateral, inflated, subangular behind; valves thick; beaks slightly prominent, rounded; cardinal teeth wide and striated; lateral teeth somewhat curved; nacre pearly and pink coloured.

Hab. Bayou Teche, Louisiana. W. M. Stewart.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Mr Stewart.

Cabinet of William Hyde.

Cabinet of P. H. Nicklin.

Diam. 1·6, Length 2·1, Breadth 2·9 inches.

Shell subglobose, subequilateral, subangular behind, inflated; substance of the shell thick; umbonial slope carinate; beaks slightly pro-

minent, rounded; ligament rather short and thick; epidermis dark brown or black; cardinal teeth wide, striate, but not divided; lateral teeth somewhat curved, serrate and separated from the cardinal teeth by the absence of a plate; anterior cicatrices distinct, posterior cicatrices confluent and large; dorsal cicatrices situated across the cavity of the beaks and very distinct; cavity of the beaks large and rounded; nacre pearly and pink coloured.

Remarks.—This very distinct species is one of the many fine shells collected by Mr Stewart in the Bayou Teche. It perhaps most resembles an inflated specimen of *U. cuneatus* (Barnes). It may, however, at once be distinguished from that species by its peculiarly beautiful pinky lustre and striate cardinal teeth, as well by its globosity. The striæ of the cardinal teeth diverge from a point beneath the point of the beaks, and in its flatness and absence of a cleft these teeth resemble those of the *U. rubiginosus* (nobis).

UNIO CAPSÆFORMIS. Plate II. fig. 4.

Testâ ellipticâ, transversâ, inæquilaterali, subinflatâ, postice subtriangulatâ; valvulis antice crassioribus; natibus prominulis; dentibus utriusque valvulæ cardinalibus, elevatis duplicibusque; lateralibus elevatis et lamellatis; margaritâ albâ et iridescente.

Shell elliptical, transverse, inequilateral, somewhat inflated, sub-biangular posteriorly; valves thicker anteriorly; beaks slightly elevated; cardinal teeth elevated and double in both valves; lateral teeth elevated and lamellar; nacre pearly white and iridescent.

Hab. Cumberland River. W. Cooper.

My Cabinet.

Cabinet of W. Cooper.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. .9, Length 1.3, Breadth 1.9 inches.

Shell elliptical, transverse, inequilateral, somewhat inflated, flattish before the umbonial slope, sub-biangular posteriorly; substance of the

shell thick anteriorly and thin posteriorly; beaks slightly elevated and rounded; ligament short and thick; epidermis yellow, with numerous small green rays; cardinal teeth elevated, double and crested in both valves; lateral teeth elevated and lamellar; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated within the cavity of the shell on the plate between the cardinal and lateral teeth and on the base of the cardinal tooth; cavity of the beaks wide and obtusely angulate; nacre white on the anterior and iridescent on the posterior portion.

Remarks.—While engaged in my last memoir, this shell attracted my attention. I had not, however, then, an opportunity of examining more than two or three specimens, and finding they differed much in some characters, I deferred noticing them. I owe to Mr Cooper the advantage of examining his specimens, which convinced me the species was distinct. This is one of those species which sometimes dilate or increase about the region of the umbonial slope, and in this and its rays it resembles, in a slight degree, the *U. perplexus* (nobis). The enlargement of this portion of the shell, which is generally a deep green, causes it to have a different outline, being there more rounded and causing the basal margin to be arcuate.



UNIO RAVENELIANUS. Plate III. fig. 5.

Testâ late ovatâ, obliquâ, inæquilaterali, postice subangulatâ; valvulis antice crassioribus; dentibus cardinalibus crassis brevibusque; lateralibus crassis rectisque; margaritâ albâ et iridescente.

Shell widely ovate, oblique, inequilateral, subangulate posteriorly; valves thicker anteriorly; cardinal teeth short and thick; lateral teeth straight and thick; nacre pearly white and iridescent.

Hab. French Broad River, tributary to the Tennessee, near Asheville, N. C. Professor Ravenel.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Professor Ravenel, Charleston, S. C.

Cabinet of P. H. Nicklin.

Cabinet of Professor Vanuxem.

Diam. .7, Length .9, Breadth 1.5 inches.

Shell widely ovate, oblique, inequilateral, subangulate posteriorly, slightly inflated, compressed at posterior and inferior margins; substance of the shell thick and white anteriorly, thin and iridescent posteriorly; ligament short and thick; epidermis dark brown and finely wrinkled; cardinal tooth short, thick and deeply divided in the left valve, single and rising from a pit in the right valve; lateral teeth oblique, straight and thick, having a direction over the lateral tooth; anterior and posterior cicatrices both distinct; dorsal cicatrices situated within the cavity of the shell on the plate between the cardinal and lateral teeth; cavity of the beaks shallow and rounded; nacre white in the anterior, and iridescent in the posterior portion.

Remarks.—This shell, which I owe to the kindness of Professor Ravenel, has, I believe, been first noticed by that gentleman, who, supposing it to be new, sent it to me about a year since. It differs in its outline from any of our eastern species, as it does also in its obliquity. In these characters it most resembles the *U. patulus* (nobis); it is, however, more dilated,—in some specimens the margin being subrotund. The only specimens obtained by Professor Ravenel being imperfect, and much eroded at the beaks, I have not described that part, leaving it for future observation. There are no rays to be observed on the specimens I have. In young or fine specimens, it is very possible they may exist.

UNIO MURCHISONIANUS. Plate III. fig. 6.

Testâ angulato-ellipticâ, transversâ, inæquilateralî, valvulis tenuiculis; natibus perplicatis; dentibus cardinalibus in valvulâ utrâque duplicibus, lateralibus rectis; margaritâ pulchrâ, iridescente, et salmonis colore subinctâ.

Shell narrow-elliptical, transverse, inequilateral; valves rather thin; beaks much

plicated; cardinal teeth double in both valves; lateral teeth straight; nacre splendidly pearly, slightly salmon coloured, and beautifully iridescent.

Hab. China. Mrs Murchison.

My Cabinet.

Diam. .7,

Length .8,

Breadth 1.9 inches.

Shell narrow-elliptical, transverse, inequilateral, angular behind, and slightly emarginate at basal margin; substance of the shell rather thin; beaks and umbones beautifully plicated; umbonial slope subcarinate and rough with the angles of the folds; posterior slope finely plicate; ligament yellow and narrow; epidermis dark green; cardinal teeth double in both valves; lateral teeth straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks shallow; nacre rich, and splendidly pearly, slightly salmon coloured, and beautifully iridescent.

Remarks.—This splendid species I owe to the great kindness of Mrs Murchison, the wife of the present learned president of the Geological Society of London. Among many fine and rare shells received from her I found this, which appears not to have been before described. It perhaps most resembles the *U. cœruleus* (nobis), particularly in the outline: it is, however, rather more transverse. It differs greatly from the *cœruleus* in the number and size of the folds. These, behind the umbonial slope, are parallel to the ligament; while those on the anterior margin are oblique. The acute angles formed by the folds on the umbonial slope are very remarkable. The inferior part of the shell is free from folds: this may not, however, prove a constant character. Its nacre is without exception finer than any I have ever seen, and rich beyond description. The folds being visible from the interior, add greatly to its lustre.*

* Since writing these remarks I have seen several specimens of this shell in Europe. At the Jardin des Plantes, Monsieur de Blainville showed me two or three specimens recently received, and not yet placed in the cabinet. He considered the shell undescribed, until I mentioned the name I had given it.

UNIO HAYSIANUS. Plate III. fig. 7.

Testâ subrotundâ, subventricosâ, ad baseos marginem posteriorem dentatâ; valvulis subcrassis; natibus prominentibus; epidermide luteo-fuscâ lævissimâque; radiis obsoletis; dentibus cardinalibus in lobos divisis, lateralibus crassis rectisque; margaritâ cacao colore tinctâ.

Shell subrotund, slightly ventricose, dentate at posterior basal margin; valves scarcely thick; beaks elevated; epidermis yellowish brown and very smooth; rays obsolete; cardinal teeth lobed; lateral teeth thick and straight; nacre chocolate coloured.

Hab. Cumberland River. Professor Troost.

My Cabinet.

Cabinet of Mr Cooper.

Cabinet of Professor Troost, Nashville.

Diam. .6, Length .8, Breadth 1 inch.

Shell subrotund, nearly equilateral, slightly ventricose, dentate at posterior margin, depressed before the umbonial slope; substance of the shell scarcely thick; beaks thick and elevated; epidermis yellowish-brown, very smooth and shining; rays obsolete; cardinal teeth lobed, double in the left valve, single and rising from a pit in the right valve; lateral teeth short, thick and straight; posterior and anterior cicatrices both distinct; dorsal cicatrices situated within the cavity of the shell on the plate between the cardinal and lateral teeth; cavity of the beaks deep and angulated; nacre chocolate coloured and iridescent posteriorly.

Remarks.—It has been in my power to examine only four or five specimens of this exceedingly interesting shell. In each of these there is more or less of a dentate appearance, which is so unusual among the *Naiades* that it may, perhaps with propriety, be said to belong to some American species only. In the early stages of growth there is no dentate appearance. The *U. sulcatus* (nobis) and the *U. arcæformis* (nobis), are frequently furnished with this curious appendage. The dentate variety, mentioned in my description of *U. sulcatus*, has been, by Mr Say, erected into a separate species, under the name of *ridibundus*; in the propriety of which, however, I cannot agree with that naturalist. In outline the present species resembles the *U. subrotun-*

dus; it is, however, more oblique, and in the epidermis more shining. It is not so oblique as the *sulcatus*, but has a furrow anterior to the umbonial slope similar to that species. In the epidermis it differs very much, the *sulcatus* being finely wrinkled and finely rayed. In some specimens the successive rows of teeth along the posterior margin cause that portion of the shell to swell out, which gives it a rich and beautiful appearance. It is, though small, among the most interesting of our species. The specimen here represented, I owe to the kindness of Mr Cooper. It is with pleasure I dedicate this species to my friend, Isaac Hays, M.D., whose talents have been actively and successfully engaged many years in the promotion of natural as well as medical science.

UNIO HILDRETHIANUS. Plate III. fig. 8.

Testâ angusto-ellipticâ, subcylindrâ, valde transversâ, inæquilaterali; valvulis tenuibus; dente cardinali in valvulâ utrâque unico, laterali nullo; margaritâ superne fuscâ, inferne albâ et iridescente.

Shell narrow-elliptical, subcylindrical, very transverse, inequilateral; valves thin; cardinal teeth single in each valve; without lateral teeth; nacre, above brown, below white and iridescent.

Hab. Ohio, near Marietta. Dr Hildreth.

My Cabinet.

Cabinet of Dr Hildreth.

Cabinet of the Academy of Natural Sciences.

Diam .5,

Length .7,

Breadth 1.6 inches.

Shell narrow-elliptical, subcylindrical, very transverse, inequilateral, somewhat compressed at basal margin; substance of the shell thin behind, thicker before; beaks slightly elevated; ligament long and thin; epidermis dark brown; cardinal teeth lobed, single in each valve, larger and wider in the left valve; lateral teeth none; anterior and posterior cicatrices both confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks shallow and tinged with dull purple; nacre white and iridescent.

Remarks.—Among the *Uniones* there is a group to which this species naturally belongs. This group is characterized by the imperfection of the hinge, the cardinal teeth being so immature as to present scarcely any thing but lobes. Like the *soleniformis* it lives under stones and other protected places. In the present species the tooth of the right valve shuts before that of the left, and the lateral teeth, if not entirely wanting, are obsolete. The group, as far as I know it at present, consists of the *U. oriens* (nobis), *U. soleniformis* (nobis), and the present species. In size and outline of the margin, this species resembles the *U. iris* (nobis). It has not, however, the brilliant nacre, nor the fine rays of that species, and in the conformation of the teeth it differs very much. Some individuals vary from the cylindrical form, being somewhat compressed. As a mark of respect for the talents of Dr Hildreth, and his assiduity in promoting a knowledge of the natural history of his vicinity, I dedicate this species to him.

UNIO SCHOOLCRAFTENSIS. Plate III. fig. 9.

*Testâ subrotundatâ, subæquilaterali, compressâ, post clivum umboniale sub-
tuberculatâ; valvulis subcrassis; natibus prominentibus; epidermide fulvâ, lato-
radiatâ; dentibus cardinalibus prominentibus, lateralibus laminatis rectisque;
margaritâ albâ et iridescente.*

Shell subrotund, nearly equilateral, compressed, slightly tuberculated behind the umbonial slope; valves rather thick; beaks elevated; epidermis yellow with broad rays; cardinal teeth elevated; lateral teeth straight and lamellar; nacre pearly white and iridescent.

Hab. Fox River of Green Bay. Mr Schoolcraft.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. .7, Length 1.1, Breadth 1.3 inches.

Shell subrotund, somewhat angular at posterior dorsal margin, nearly equilateral, compressed, slightly tuberculated posterior to umbonial slope; substance of the shell rather thick; beaks elevated; ligament short; epidermis smooth, somewhat yellow, with several broad green rays—that over the centre of the disk being broadest; cardinal teeth

elevated and cleft in the left valve, single and rising from a pit in the right; lateral teeth elevated, straight and lamellar; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices within the cavity of the shell on the base of the cardinal tooth; cavity of the beaks angular and deep; nacre pearly white and iridescent.

Remarks.—Among the many fine shells presented to the Academy of Natural Sciences by Mr Schoolcraft from the region of the upper lakes, there was a single specimen of the present species. It does not seem referable to any described species, and I have consequently been induced to give it a separate place in the genus. It resembles most the *U. rubiginosus* (nobis) in outline, but differs from it in being more rounded on the inferior and posterior portions of the margins, as well as in the cardinal tooth being more elevated and more deeply cleft. In the rays it differs very much from that species. In this specimen they are very remarkable, there being a very distinct broad one anterior to the umbonial slope, covering one third of the side of the disk, and two smaller, posterior to the umbonial slope. When there is but a single specimen to describe from, it should be remembered that many characters are not permanent, and I should not be surprised if specimens of this species be found without a single ray, although they are so striking in this. The tubercles, which are so indistinct, may in other specimens be more distinct and more numerous. In this case it will approach so closely to the *asperrimus* (nobis), that it may prove to be only a variety.

UNIO GEOMETRICUS. Plate IV. fig. 10.

Testâ trapezoidali, valde inequilaterali, transversâ, compressâ; valvulis tenuibus; natibus prominulis, rugis concentricis; dentibus cardinalibus in valvulâ utraq̃ue obliquis duplicibusque, lateralibus subrectis; margaritâ purpureâ.

Shell trapezoidal, very inequilateral, transverse, compressed; valves thin; beaks slightly prominent and concentrically wrinkled; cardinal teeth oblique and double in both valves; lateral teeth nearly straight; nacre purple.

Hab. Bayou Teche, Louisiana. W. M. Stewart.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Mr Stewart.

Cabinet of Mr Hyde.

Diam. .9, Length 1.4, Breadth 2.7 inches.

Shell trapezoidal, very inequilateral, transverse, compressed, angular behind; substance of the shell rather thin; umbonial slope subcarinate; beaks slightly prominent, placed near the anterior margin and concentrically wrinkled; carina much elevated; ligament long, narrow and nearly straight; epidermis dark brown, wrinkled and sometimes obscurely rayed; cardinal teeth oblique and double in both valves; lateral teeth nearly straight and lamelliform; anterior cicatrices distinct, posterior cicatrices confluent; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the beaks shallow: nacre purple and iridescent.

Remarks.—This interesting species is one of the collection made by Mr Stewart in the Bayou Teche. It is a very distinct and beautiful species. Its form is more like a trapezium than that of any other species with which I am acquainted. It resembles most the *U. complanatus* (Soland.). It differs from it, however, in its remarkable outline, in its teeth, in the concentric wrinkles of the beaks, and in the beaks being placed nearer to the anterior margin. The angle of the posterior margin is also more acute. In the deep brown colour of the epidermis and in outline of the margin it approaches the *U. obesus* (nobis). It is, however, much less inflated.

UNIO TAITIANUS. Plate IV. fig. 11.

Testa subtriangulari, obliquâ crassâque; valvulis antice crassioribus; dentibus cardinalibus grandibus et elevatis, lateralibus crassis et subcurvis; margaritâ albâ.

Shell subtriangular, thick and oblique; valves thicker anteriorly; cardinal teeth large and elevated; lateral teeth thick and slightly curved; nacre pearly white.

Hab. Alabama River. Judge Tait.

My Cabinet.

Diam. 1·1,

Length 1·5,

Breadth 1·5 inches.

Shell subtriangular, thick, oblique, depressed anterior to umbonal slope; substance of the shell very thick anteriorly and thin posteriorly; beaks very thick and much elevated; epidermis dark brown and wrinkled; cardinal teeth large, crenate and deeply cleft in the left valve, and emerging from a pit in the right; lateral teeth thick, slightly curved and nearly parallel with the line of the cardinal teeth; anterior cicatrices distinct, the great one forming a deep pit; posterior cicatrices distinct, the smaller one being placed at the end of the lateral tooth; dorsal cicatrices situated on the plate between the cardinal and lateral teeth; cavity of the beaks shallow; nacre pearly white.

Remarks.—There is no species which this so closely resembles as the *scalenius* (Rafin.). It is, however, less oblique and more expanded along the posterior basal margin, and the posterior margin forms a more obtuse angle. It is with great pleasure I name it after my friend, Judge Tait of Claiborne, Alabama, to whom science is greatly indebted for his exertions in making known the natural history of his vicinity.

UNIO LACTEOLUS. Plate VIII. fig. 19.

*Testâ ellipticâ, transversâ, inæquilaterali, subinflatâ; valvulis subcrassis; nati-
bus radiatis, plicis brevibus; dentibus cardinalibus in valvulâ utrâque duplicibus
longisque; lateralibus longis, a cardinalibus separatis; margaritâ lacteolâ.*

Shell elliptical, transverse, inequilateral, somewhat inflated; valves not thick; beaks having short radiating folds; cardinal teeth long and double in both valves; lateral teeth long and separate from the cardinal teeth; nacre pearly and milk white.

Hab. Rio de la Plata.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of W. Hyde.

Unio delodonta? Lam.

Diam. 1·2, Length 2, Breadth 3·2 inches.

Shell elliptical, transverse, inequilateral, somewhat inflated; substance of the shell not thick; beaks rounded, having short radiating folds; ligament rather short; epidermis dark brown and wrinkled; cardinal teeth long, oblique, nearly parallel with the margin and double in both valves; lateral-teeth long, slightly curved and separated from the cardinal teeth by the absence of a plate; anterior and posterior cicatrices both confluent; dorsal cicatrices situated across the cavity of the beaks; cavity of the beaks rounded and not deep; nacre very pearly, milk white, iridescent behind.

Remarks.—I am indebted to the kindness of Dr Ward of Salem, for a perfect specimen of this species. In outline it approaches the *U. marginalis* (Lam.), but is less transverse. In the characters of its teeth it closely resembles that species. It differs from it in being more inflated, more wrinkled and in having a thicker nacre. In the possession of radiated folds on the beaks it differs altogether.

On the base of the cardinal tooth, near to the great cicatrix, there is a small deeply impressed cicatrix, resembling in its characters that of the *Hyria avicularis* (Lam.), mentioned at page 67, Vol. IV.

The specimen here figured belongs to the fine cabinet of Mr Hyde.

SYMPHYNOTA GLOBOSA. Plate IV. fig. 12.

Testâ valde globosâ, inæquilateralî, pellucidâ; valvulis tenuiculis, natibus rotundissimis, incurvis; epidermide luteâ, lævissimâ; dentibus cardinalibus laminatis, lateralibus elevatis et laminatis; margaritâ albâ et iridescente.

Shell very globose, inequilateral, translucent; valves rather thin; beaks very round, incurved; epidermis very smooth and pale yellow; cardinal teeth lamellar; lateral teeth elevated and lamellar; nacre pearly white and iridescent.

Hab. River Ohio, 150 miles below Louisville. Col. Long.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Peale's Museum.

Diam 2·4, Length 2·5, Breadth 3·5 inches.

Shell very globose, inequilateral, translucent, very smooth and bright; connate before and behind the beaks; substance of the shell rather thin; beaks very round, incurved; epidermis very smooth, and pale yellow or straw colour; umbones very round; cardinal teeth very lamellar, elevated, double in the right valve, and very crenate and single in the left; the line of the lateral and cardinal teeth form two curves; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated in the cavity of the beaks on the under side of the cardinal teeth; pallial cicatrix deeply impressed; cavity of the beaks very round and very deep; nacre thicker near the margin, beautifully pearly white and iridescent.

Remarks.—We owe to Col. Long and Mr T. Peale the knowledge of this singular and distinct species. Without a tubercle and almost rayless, for those on the posterior slope are obsolete, it is among the most beautiful and interesting species known. The Academy is in possession of four fine specimens, making a complete suite of different ages. Three of them are perfect enough to display the character of this genus, *Symphynota*, notwithstanding their great globosity. It is more capacious than any of the *Naiades* I have seen, and the light yellow or straw coloured epidermis is very peculiar—in form it most resembles, perhaps, the *Unio occidentalis* (nobis), but it has no rays. In the younger individuals there is a transverse rib-like appearance which I have noticed in no other species of the family.

SYMPHYNOTA WOODIANA. Plate V. fig. 13.

Testâ subpentagonâ, postice angulatâ, super umbones turgidâ, inæquilateralî, transversâ; valvulis tenuibus; epidermide tenebroso-fuscâ et obscuro-radiatâ; natibus undulatis; margaritâ albâ et iridescente.

Shell subpentagonal, angular behind, turgid over the umbones, inequilateral, transverse; valves thin; epidermis dark brown and obscurely rayed; beaks undulated; nacre pearly white and iridescent.

Hab. China. W. W. Wood.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. 1·5, Length 2·2, Breadth 3·5 inches.

Shell subpentagonal, angular behind, transverse, inequilateral, irregularly swollen over the umbones, slightly compressed somewhat before and below the umbones, posterior slope carinate; substance of the shell thin; epidermis wrinkled, dark brown with obsolete rays; ligament long and somewhat thick; beaks slightly inflated and undulated; cicatrices scarcely perceptible posteriorly, more deeply impressed anteriorly; cavity of the beaks shallow; cavity of the disk impressed immediately under the umbo; nacre pearly white and iridescent.

Remarks.—This species was first, I believe, brought to this city from Canton by Mr Wood* about five years since. To him I owe the first specimen I have seen. A younger and fine specimen I owe to the kindness of an estimable friend and accomplished conchologist, Mrs Corrie, who sent it to me from England about two years since, with a label "From China." It closely resembles the preceding species in many characters. All the specimens, however, which I have seen, perhaps half a dozen, retain the distinctive characteristics—the greater transverseness—the subpentagonal form—the slight compression anterior to the umbones—the dark epidermis—the absence almost entirely of rays and its want of a rich nacre—in all these it differs from the *magnifica* herein described. It is usually larger than the specimen figured.

SYMPHYNOTA MAGNIFICA. Plate V. fig. 14.

Testâ subrotundâ, prope nates valde inflatâ, inæquilaterali, postice obtuso-angulatâ; valvulis tenuibus; epidermide luteâ, multis radiis viridibus; natibus

* On my return from Europe I found a box of shells sent to me by Mr Wood from Canton, in which were several specimens of a tuberculated *Unio*, which, on examination, I perceived immediately to be a new species, which the distinguished naturalist, John Edward Gray, Esq., of London, did me the honour, while in that city last June, to name *Leanus*.

inflatis, prope apices undulatis ; cicatricibus vix cernendis ; margaritâ pulchrâ et iridescente.

Shell subrotund, much inflated near the beaks, inequilateral, obtusely angular behind; valves thin; epidermis yellow, with numerous green rays; beaks inflated, near the tip undulated; cicatrices scarcely perceptible; nacre beautifully pearly and iridescent.

Hab. China. W. W. Wood.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Mr Hyde.

Diam. 1·6,

Length 2·3,

Breadth 3·4 inches.

Shell subrotund, much inflated in the region of the beaks, inequilateral, connate before and behind the beaks, obtusely angular behind, rounded before, posterior slope carinate; substance of the shell thin; epidermis smooth, yellow with numerous beautiful green rays over the whole disk, which are darker on the posterior part and obsolete on the umbones; ligament long and thin; beaks inflated and terminated with about six nearly parallel undulations; teeth, none; cicatrices scarcely perceptible; cavity of the beaks shallow and rounded; nacre beautifully pearly and highly iridescent, sometimes tinged with salmon and pink.

Remarks.—Several specimens of this species have been within a few years received from Canton, and Mr Wood, to whom I owe one of mine, informed me that he believes it to be a native of that country, and most probably dwelling in the waters of the neighbourhood of Canton. It is certainly among the most beautiful of the genus which has come under my notice, and is remarkable for its great area, its inflation of the region of the beaks, its smooth epidermis, its splendid rays and exquisitely beautiful nacre, which no pencil can imitate. I have it of several different ages—when very young it is less rotund, being somewhat trapezoidal, the dorsal margin nearly straight and the rays obsolete. The specimen figured is not half the size of the largest specimen in my cabinet, but I have chosen it for its great perfection in having the valves completely connate before and behind the beaks.

ANODONTA FERUSSACIANA. Plate VI. fig. 15.

Testâ subcylindræâ, inæquilaterali, inflatâ; margine dorsali sub natium apices curvâ; valvulis tenuibus; epidermide fulgidâ, obsolete radiatâ, olivæ colorem tenebrosam habente; natibus prominulis, binis ternisve undulis exiguis ad apices; cicatricibus conspicuis; margaritâ cæruleo-albâ et iridescente.

Shell subcylindrical, inequilateral, inflated; dorsal margin curved immediately under the point of the beak; valves thin; epidermis dark olive, shining, with obsolete rays; beaks somewhat prominent with two or three small undulations at tip; cicatrices perceptible; nacre bluish white and iridescent.

Hab. Ohio River, near Cincinnati. T. G. Lea.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Mr Nicklin.

Cabinet of Professor Vanuxem.

Cabinet of the American Philosophical Society of Philadelphia.

Diam. 1·4, Length 1·8, Breadth 3·5 inches.

Shell subcylindrical, inequilateral, much inflated, more angular behind than before; dorsal margin curved immediately under the point of the beak; basal margin disposed to be emarginate; substance of the shell thin; epidermis dark olive, shining, with numerous obsolete rays, near the beaks lighter and destitute of rays; ligament rather short and thin; beaks somewhat prominent with two or three small undulations at tip; cicatrices perceptible; cavity of the beaks shallow; cavity of the disk deep and rounded; nacre bluish white and iridescent.

Remarks.—This species was received with the *A. incerta*, herein described, from the Ohio river. It differs from that species in having prominent beaks, in being more cylindrical, in its dark colour, and in the curve which exists immediately under the beaks, in which it resembles the *A. areolus* (Swainson). In the latter this curve is so strong and thick as to resemble an incipient tooth. In young specimens the epidermis is more on the yellow, and the rays greenish and bright.*

* Since the above description was made and the figure printed, I am in possession of several specimens from Illinois, beautifully and very distinctly rayed.

ANODONTA INCERTA. Plate VI. fig. 16.

Testâ lato-ellipticâ, postice subangulatâ, inflatâ, margine dorsali subrectâ ; valvulis tenuissimis ; epidermide subviride, obsolete radiatâ ; natibus complanatis et minute undulatis ; cicatricibus vix cernendis ; margarilâ cœruleo-albâ et iridescente.

Shell wide-elliptical, subangular behind, inflated, nearly straight on the dorsal margin ; valves very thin ; epidermis greenish with obsolete rays, beaks flattened and minutely undulated ; cicatrices scarcely perceptible ; nacre bluish white and iridescent.

Hab. Ohio River near Cincinnati. T. G. Lea.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Professor Vanuxem.

Cabinet of P. H. Nicklin.

Diam. 1·2, Length 1·5, Breadth 3·2 inches.

Shell wide-elliptical, subangular behind, inequilateral, inflated, dorsal margin nearly straight, rounded before ; substance of the shell very thin ; epidermis very smooth, green and olive green with obsolete rays, three being more distinct on the posterior part of each valve ; ligament long and thin ; beaks flattened, minutely undulated near the tip which terminates with a minute point from which an indistinct line runs towards the posterior margin ; cicatrices scarcely perceptible ; cavity of the beaks scarcely perceptible ; cavity of the disk deep and rounded ; nacre bluish white and iridescent.

Remarks.—Among the earliest shells I procured from the Ohio, many years since, were several specimens of this fragile *Anodonta*. The difficulty of separating the species of a genus with so few tangible characters induced me to lay this aside with some other species until more leisure would permit a thorough examination. It perhaps most closely resembles the *A. cataraeta* of Say, but differs from it peculiarly in the flatness of the beaks. It is generally more inflated, particularly near the umbonal slope. It resembles the *A. Ferussaciana* (nobis), the description of which see. The young differ from the old in being much compressed and in having rays only on the posterior part of the shell, where the three on each valve are distinctly visible—they are

also more straight on the dorsal margin. The smoothness and polish, as well as the brightness of the green of some of the specimens are very remarkable.

ANODONTA STEWARTIANA. Plate VI. fig. 17.

Testâ rotundato-ovatâ, valde inflatâ; valvulis pertenuibus; epidermide subasperâ, tenebroso-viridi, natibus prominentibus, apicibus granulatis; cicatricibus subobsoletis aut vix perspicuis; margarita cœruleo-albâ.

Shell rotundo-ovate, much inflated; valves very thin; epidermis roughish, olive green; beaks prominent and granulate at tip; cicatrices scarcely perceptible; nacre bluish white.

Hab. River Teche, Louisiana. W. M. Stewart.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Mr Stewart.

Diam. 1·8, Length 2, Breadth 3·1 inches.

Shell rotundo-ovate, much inflated, subangular behind; dorsal line slightly curved; substance of the shell thin; epidermis somewhat rough, olive green and obsoletely rayed; beaks prominent, granulate at tip in a short double series; cicatrices scarcely perceptible; cavity of the beaks deep and incurved; cavity of the disk deep and rounded; nacre bluish white and iridescent, sometimes tinged with salmon colour about the region of the beaks.

Remarks.—I owe this species with numerous others to my friend Mr Stewart who procured and gave it to me more than two years since. I did not then describe it, although I believed it to be new, intending it to accompany some others which are now embodied in this memoir. It is an interesting species, being much inflated—the young specimens approached the globose form. It is most similar in form to the *gibbosa* (Say), but is perhaps less inflated, does not possess a polished epidermis, and has granulations at the termination of the beaks, while the *gibbosa* has undulations. The inflation of the *Stewartiana* is more

spherical, the other is gibbous. The posterior slope of the young specimen is decorated with six distinct green rays, there being three on each valve.

ANODONTA PALNA. Plate VII. fig. 18.

Testâ subovatâ, inæquilaterali, subcompressa; valvulis subcrassis; epidermide olivaceâ et obsolete radiatâ; natibus prominentibus; apicibus granulatis; cicatricibus perspicuis; margaritâ albâ; sed in natium cavo interdum colore salmonis tinctâ.

Shell subovate, inequilateral, rather compressed; valves somewhat thick; epidermis olive with obsolete rays; beaks prominent and granulate at tip; cicatrices perceptible; nacre white, sometimes salmon in the cavity of the beaks.

Hab. Bear Grass Creek, near Louisville. Mr T. H. Taylor.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Mr Ronaldson.

Diam. 2·3,

Length 3·1,

Breadth 5·6 inches.

Shell subovate, inequilateral, rather compressed, subangular behind; dorsal line slightly curved; substance of the shell thick; epidermis smooth, olive to dark green, brighter on the beaks; rays obsolete; ligament long and thick; beaks elevated, granulate at tip; cicatrices perceptible; cavity of the beaks rather deep and rounded; cavity of the disk somewhat flattened; nacre white, sometimes salmon coloured in and about the cavity of the beaks.

Remarks.—This species of *Anodonta* offers quite a large area in the circumference of the disk. Some specimens are, however, more transverse than the one here described. It has a predisposition to salmon colour in the region of the cavity of the beaks, and this is sometimes of a very deep tint. The colour is irregularly distributed, sometimes quite in spots, and a roughness, apparently a disease, often accompanies it and produces a carious state of the nacre. It perhaps most closely resembles the *A. cataracta* (Say); but is usually less inflated, is thicker in the substance of the shell, and less transverse.

HELICINA LENS. Plate XIX. fig. 56.

Testâ parvâ, lenticulari, supra luteâ, sublus rufâ; anfractibus tribus, quorum inferiori carinato; spirâ plano-convexâ; aperturâ dilatâtâ; labro crasso; columellâ subcallosâ et luteolâ.

Shell small, lenticular, yellow above and red below; whorls three, inferior one carinate; spire plano-convex; aperture dilated; outer lip thick; columella thinly coated and yellowish.

Hab. Feejee Islands. W. W. Wood.
My Cabinet.

Diam. 5-20ths, Length 4-20ths of an inch.
The smaller figure is of the size of nature.

Remarks.—The lenticular form and sharp carina of the body whorl distinguish this species. Within it is orange, and about the base of the shell there is a disposition to yellow.

HELICINA PULCHERRIMA. Plate XIX. fig. 57.

Testâ subviridi, subglobosâ, crassâ, minute striatâ; anfractibus quaternis, quorum infimo fasciâ albo-fuscâ induto; spira obtusâ; aperturâ dilatâtâ; labro albo et reflexo; columellâ callosâ, albâ, fulgenti, tuberculo parvo ad basim.

Shell subglobose, greenish, thick, finely striate; whorls four, the body whorl having an indistinct white and brown band; spire obtuse; aperture dilated; outer lip white and reflected; columella white, thickly coated and shining, with a small tubercle at the bottom.

Hab. Java?

My Cabinet.

Diam. .8, Length .7 of an inch.

Remarks.—This is perhaps the finest species yet known of the

genus. It is remarkable for its size and weight, and the strong and wide callus on the columella. Under the epidermis it varies from a dark orange to lemon yellow. A depauperated specimen in my possession would scarcely be recognized as the same species, owing to the density of the orange colour. The apex of the perfect shell, having but a thin epidermis, presents an orange appearance,—this colour may also be observed on the inside of the shell. At the base of the columella there is an obsolete tubercle. The band sometimes consists of a single white line only. It is believed these specimens formed part of the collection brought from Java by Mr Shillaber.

HELICINA VIRGINEA. Plate XIX. fig. 58.

Testâ subconicâ, apice acutâ, subtus inflatâ, crassâ, transversim multisulcatâ; anfractibus senis; spira elevatâ; aperturâ valde dilatatâ; labro effuso; columellâ subcallosâ.

Shell subconical, acutely pointed, inflated below, thick, with many transverse furrows; whorls six; spire elevated; aperture much dilated; outer lip effuse; columella thinly coated.

Hab. Java?

Helicina striata? Lam.

My Cabinet.

Diam. .8,

Length .8 of an inch.

Remarks.—This species came in the same collection as that described last. It is nearly of the same diameter. It differs from it altogether in form and colour. It is remarkable for its acutely pointed apex, its milk-white appearance, and its numerous furrows. The outer lip may, with propriety, be said to be effuse rather than reflected.

HELIX MUSCARUM. Plate XIX. fig. 59.

Testâ globosâ, crassâ, politâ, longitudinaliter nitide striatâ, subfuscâ; maculis numerosis irregularibus minutis, et fasciis albis subnigris et fuscis indutâ; anfractibus ternis; spirâ rotundatâ; apice albâ; aperturâ subrotundâ; labro acuto, intus crassescenti; labio subrufo; columellâ lævi albâque.

Shell globose, thick, polished, longitudinally and finely striated, light brown, furnished with numerous irregular minute spots, and blackish brown and white bands; whorls three; spire rounded; apex white; aperture nearly round; right lip sharp, growing thicker within; left lip light red; columella smooth and white.

Hab. Society Islands, Pacific Ocean. Lieutenant Dornin.

My Cabinet.

Diam. .8,

Length .7 of an inch.

Remarks.—This curiously and elegantly painted shell I owe to Lieutenant Dornin, who, when on board the sloop of war Vincennes on her voyage round the world, very kindly collected for me many rare and fine specimens. It is eminently distinguished by its compound band, its globosity, and its innumerable minute spots. The columella is somewhat thickened by a dark pink deposit.

HELIX PURPURAGULA. Plate XIX. fig. 60.

Testâ obtuso-conicâ, crassâ, inferne planulatâ, politâ, longitudinaliter minute striatâ, superne luteâ et fusco-virgatâ, inferne luteâ, in medium anfractum obscuro-fasciatâ, subsuturam maculatâ, imperforatâ; anfractibus quinis; spirâ obtuso-conicâ; aperturâ ovatâ, intus purpureâ; labro reflexo, prope basim majori; columellâ lævi, ad basim subconcavâ.

Shell obtusely conical, thick, flattened below, polished, minutely and longitudinally striate, above yellow and striped with brown, below yellow, obscurely banded on the middle of the whorl, irregularly spotted on the inferior part of the suture, imperforate; whorls five; spire obtusely conical; aperture oval, purple inside; outer lip sub-reflected, enlarged towards the base; columella smooth and impressed at base.

Hab. Java?

My Cabinet.

Diam. .9,

Length .6 of an inch.

Remarks.—The solidity, smoothness and purple colour of this species, which is supposed to have been of Mr Shillaber's collection, will serve to distinguish it. Like the *mamilla*, herein described, it has a thick lip and is impressed at the base of the columella. The two specimens which I have differ much in the arrangement of colour. In one the inferior portion is almost white, and a dark interrupted band encircles the middle of the whorl.

HELIX OVUM REGULI. Plate XIX. fig. 61.

Testâ super et subtus planulatâ, colore columbino tinctâ, minutis irregularibus maculis numerosis, imperforatâ; anfractibus quaternis; spirâ valde depressâ; aperturâ subovalâ, intus purpurascenti; labro acuto, subreflexo; columellâ lævi, ad basin subconcavâ.

Shell flattened above and below, dove coloured, with numerous irregular minute dots, imperforate; whorls four; spire much flattened; aperture suboval, purplish inside; outer lip somewhat reflected but sharp; columella smooth, at base impressed.

Hab. Java?

My Cabinet.

Diam. .8,

Length .4 of an inch.

Remarks.—The very peculiar colour and the minute dots of this beautiful and interesting species eminently distinguish it from all other species which have come under my notice. The line of the superior part of the lip is almost parallel with the corresponding inferior part, and the outer posterior is consequently more round. In my specimens there are two very indistinct bands, rather lighter than the ground. In colour it greatly resembles a spotted small egg of a bird. It is supposed to have come from Mr Shillaber's collection.

HELIX MONODONTA. Plate XIX. fig. 62.

Testâ superne subconicâ, inferne inflatâ, lævi, albâ, fasciis duabus fuscis, imperforatâ; anfractibus ternis; spirâ obtusâ; aperturâ subrotundâ; labro acuto, subreflexo, subtus unico dente induto; columellâ lævi.

Shell subconical above, inflated below, smooth, white, with two brown bands, imperforate; whorls three; spire obtuse; aperture nearly round; outer lip somewhat reflected but sharp, having a single tooth on the lower limb; columella smooth.

Hab. Java?

My Cabinet.

Diam. 9-20ths,

Length 7-20ths of an inch.

Remarks.—The two brown bands and single tooth of this species, together with the absence of an umbilicus, may serve to distinguish it. The superior termination of the lip is bent down towards the base of the columella. It is supposed to be from the collection of Mr Shillaber.

**HELIX CYCLOSTOMOPSIS. Plate XIX. fig. 63.**

Testâ subgloboseâ, superne depressâ, inferne inflatâ, longitudinaliter et minute striatâ, pellucidâ, corneâ, late umbilicatâ; anfractibus quaternis; spirâ depressâ; aperturâ subcirculari; labro crasso et reflexo; columellâ lævi, ad basin crassescenti.

Shell subglobose, depressed above, inflated below, longitudinally and minutely striate, translucent, horn coloured, widely umbilicate; whorls four; spire depressed; aperture nearly a circle; outer lip thick and reflected; columella smooth, at the base thickened.

Hab.

My Cabinet.

Diam .9,

Length .6 of an inch.

Remarks.—In its aperture this species has a strong resemblance to a *Cyclostoma*. The superior and inferior portions of the lip do not, however, join by one-fifth of a circle—the resemblance is strong in the

thickness and reflection of the lip. The last whorl is very round—the umbilicus large and partly covered.



HELIX MAMILLA. Plate XIX. fig. 64.

Testâ solidâ, elevatâ, obtuso-conicâ, inferne rotundatâ, imperforatâ, colore columbino tinctâ, longitudinaliter nitide striatâ, fasciis duabus obsoletis indutâ, apice subrufo; anfractibus quinis, rotundatis; spirâ exsertâ; aperturâ subrufâ, ovatâ; labro subreflexo, crasso, prope basin majori; columellâ lævi, ad basin subconcavâ.

Shell solid, elevated, obtusely conical, rounded below, imperforate, dove coloured, transversely and finely striate, with two obsolete bands, pink at the apex; whorls five and rounded; spire elevated; aperture pink, oval; outer lip somewhat reflected, thick, enlarged towards the base; columella smooth, at the base impressed.

Hab. . . .

My Cabinet.

Diam. .8,

Length .7 of an inch.

Remarks.—I have rarely met with a more beautiful and interesting species of the genus than the above. It is eminently distinguished by its solidity, its thick, smooth and beautifully coloured lip, its fine delicate colour, and its elevated and red tipped spire. The columella is somewhat thickened and deeply impressed at the base.

It is to be regretted that the habitat of this species is not known. It was met with accidentally at a dealer's.



HELIX DIAPHANA. Plate XIX. fig. 65.

Testâ latâ, superne depressâ, inferne inflatâ, longitudinaliter et nitide striatâ; subluteâ, obscure bifasciatâ super medium anfractum, umbilicatâ; anfractibus quaternis; spirâ planulatâ; aperturâ magnâ et subrotundâ; labro simplici; columellâ brevissimâ læviqve.

Shell wide, depressed above, inflated below, longitudinally and finely striate, pale yellow, obscurely banded above the centre of the whorl, umbilicated; whorls four;

spire flattened ; aperture large and nearly round ; outer lip simple ; columella very short and smooth.

Hab.

My Cabinet.

Diam. 1·4,

Length ·7 of an inch.

Remarks.—This species has a strong resemblance to *H. citrina*. It may be distinguished from that species by its colour, which is more pale, being almost a light horn colour ; by its being more flattened, and by its band, which is white bordered on each side by a delicate brown line. The umbilicus is small.



HELIX HIMALANA. Plate XIX. fig. 66.

Testâ sinistrosâ, subcarinatâ, tenui, subdiaphanâ, umbilicatâ, superne subconvexâ, inferne inflatâ, longitudinaliter et transversim minute striatâ, superne fuscoluteâ, inferne fuscâ, prope carinam tenebrosiori ; anfractibus quaternis ; spirâ obtusâ ; aperturâ late rotundatâ ; labro simplici et acuto ; columellâ brevi.

Shell sinistral, subcarinate, thin, translucent, umbilicated, obtusely convex above, inflated below, longitudinally, transversely and minutely striate, superior part brownish yellow, inferior part brown, being more intense near the carina ; whorls four ; spire obtuse ; aperture widely rounded ; outer lip simple and sharp ; columella short.

Hab. Himalaya Mountains. Dr Burrough.

My Cabinet.

Cabinet of Dr Burrough.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Mr Hyde.

Diam. 1·1,

Length ·7 of an inch.

Remarks.—In the splendid collection of objects of natural history brought from India and other countries by Dr Burrough was this species, which Dr B. procured himself among the Himalaya mountains. It is easily distinguished from any species I am acquainted with, and approaches most closely to the *H. lævipes* (Fer.). Its sinistral opening,

its translucency, and its colours are very characteristic. On the inferior part of the carina, which is obtuse, the brown colour is more intense—on the superior part the yellow is brightest.

HELIX VESICA. Plate XIX. fig. 67.

Testâ tenui, pellucidâ, superne elevatâ et fusco-luteâ, inferne inflatâ albâque, transversim minute striatâ, umbilicatâ, anfractibus quinis; spirâ obtuso-conicâ; aperturâ subrotundâ; labro tenui et reflexo, inferne crassescenti; columellâ lævi.

Shell thin, transparent, elevated and brownish yellow above, inflated and white below, longitudinally and minutely striate, umbilicated; whorls five; spire obtusely conical; aperture nearly round; outer lip thin and reflected, on the lower part slightly thickened; columella smooth.

Hab.

My Cabinet.

Diam. .7,

Length .5 of an inch.

Remarks.—This species is peculiarly transparent, and very strongly resembles the cuticle of a blister or the bladder of a fish. This character, and its pale brownish-yellow superior portion, and white inferior portion, together with its longitudinal striæ, eminently distinguish it. The lower part of the reflected lip is so much thickened as almost to form a tooth.

HELIX CINCTA. Plate XIX. fig. 68.

Testâ superne depressâ, inferne inflatâ, longitudinaliter striatâ, umbilicatâ, rufo-fuscâ, fasciam fuscâ aut nigram super medios anfractus habente; anfractibus quaternis; spirâ planulatâ, aperturâ subrotundatâ; labro simplici; columellâ lævi.

Shell depressed above, inflated below, longitudinally striate, umbilicated, reddish brown, with a dark brown or black band above the middle of the whorls; whorls four; spire flattened; aperture nearly round; outer lip simple; columella smooth.

Hab. Java?

My Cabinet.

Diam. .9,

Length .6 of an inch.

Remarks.—The fine reddish-brown ground and intensely dark band distinguish this fine *Helix*. In my specimen, which is the only one I have seen, the inferior margin of the band has, adjoining it, an obscure band, of a tint somewhat lighter than the ground. It should be observed, that when other specimens may be examined, the bands may not prove so regular as in the present specimen. Around the umbilicus the colour is more pale.

HELIX WOODIANA. Plate XIX. fig. 69.

Testâ supra obtuso-conicâ, inferne inflatâ, longitudinaliter et nitide striatâ, albidâ, pellucidâ, fasciâ unicâ in medium anfractum, late umbilicatâ; anfractibus qualernis; spira obtusâ, aperturâ rotundatâ latâque; labro reflexo; columellâ lævi.

Shell obtusely conical above, inflated below, longitudinally and finely striate, pale and translucent, with a single band on the centre of the whorl, widely umbilicate; whorls four; spire obtuse; aperture wide and round; outer lip reflected; columella smooth.

Hab. China near Canton. W. W. Wood.

My Cabinet.

Cabinet of Mr Hyde.

Cabinet of P. H. Nicklin.

Diam. .6,

Length .4 of an inch.

Remarks.—Among a number of fine shells taken by Mr Wood, who devoted himself much to natural history during some years' residence in China, was this species and the *globula* herein described, both from the neighbourhood of Canton. It may be distinguished by its brown band, its round aperture and enlarged umbilicus.

HELIX GLOBULA. Plate XIX. fig. 70.

Testâ globosâ, tenebroso-corneâ, pellucidâ, umbilicatâ, longitudinaliter striatâ; anfractibus quinis; spirâ obtuso-elevatâ; aperturâ latâ et subrotundâ; labro simplici; columellâ lævi.

Shell globose, dark horn colour, translucent, umbilicated, longitudinally striate; whorls five; spire obtusely elevated; aperture wide and round; outer lip simple; columella smooth.

Hab. China, near Canton. W. W. Wood.

My Cabinet.

Cabinet of Mr Hyde.

Diam. .6,

Length .5 of an inch.

Remarks.—I owe to the kindness of Mr Wood the specimen which is here figured. It is remarkable for its globular form and its dark horn-coloured epidermis. It has somewhat the aspect of a *Paludina*.

PALUDINA BI-MONILIFERA. Plate XIX. fig. 71.

Testâ abbreviato-turritâ, tenebroso-corneâ, apice obtusâ; anfractibus seriebus duabus nodulorum circumdatis; nodulis seriei inferioris anfractuum superiorum suturâ celatis; nodulis seriei superioris majoribus, et super omnes anfractus conspicuis; suturis profundis et irregularibus; labro sub-biangulato; basi subangulatâ.

Shell obtusely turrit, dark horn colour; apex obtuse; whorls furnished with two rows of nodules; the nodules of the lower row of the upper whorls hidden by the suture, those of the upper row larger, and visible on all the whorls; sutures deep and irregular; outer lip sub-biangular; base subangular.

Hab. Alabama River. Judge Tait.

My Cabinet.

Cabinet of Professor Vanuxem.

Cabinet of the American Philosophical Society.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of P. H. Nicklin.
Cabinet of Baron Ferussac.

Diam. 1·1,

Length 1·8 inches.

Remarks.—This superb *Paludina*, which far surpasses in point of beauty any of our species yet known, I owe to the kindness of Judge Tait. Its beautiful double tuberculated cincture at once distinguishes it from all described species. Some specimens are furnished with dark purple bands which beautifully decorate the interior of the shell, and give a dark rich green colour to its fine epidermis. In the others these are wanting, and the epidermis then has a clear and more yellow appearance. The sutures being formed immediately over the lower row of tubercles, they cause its line to be very irregular; and this row itself is hidden on the upper whorls.

SUPPLEMENT.

Read before the American Philosophical Society, March 15th, 1833.

SINCE I had the pleasure to present to this Society, nearly a year since, a Memoir on the *Naiades* and some other families, I have had it in my power to procure several interesting species, hitherto unnoticed by naturalists. In the large collection of rare shells which I procured in Europe while there last year, some of these were discovered; and most of them are, perhaps, the only specimens known, being now first described. The observations on, and corrections of, Lamarck's *Naiades*, it is hoped, will prove useful to the American conchologist.

UNIO PARALLELOPIPEDON. Plate VIII. fig. 20.

Testâ oblongâ, subcylindrâ, transversâ, valde inæquilaterali, postice angulatâ, inflatâ, marginibus dorsi et baseos parallelis; valvulis subcrassis; natibus prominulis, retusis; epidermide fere nigrâ; dentibus cardinalibus obliquis, cristatis; lateralibus longis rectisque; margaritâ albâ et iridescente.

Shell oblong, subcylindrical, dorsal and basal margins parallel, transverse, very inequilateral, angular behind, inflated; valves rather thick; beaks somewhat elevated, retuse; epidermis almost black; cardinal teeth oblique, crested; lateral teeth long and straight; nacre pearly white and iridescent.

Hab. River Parana, Province of Corrientes.

My Cabinet.

Cabinet of Dr Burrough.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. .9, Length 1.2, Breadth 2.7 inches.

Shell oblong, subcylindrical, dorsal and basal margins parallel, transverse, very inequilateral, flattish on the sides, angular behind, inflated; substance of the shell rather thick; beaks rather elevated and placed near the anterior margin; ligament long and thin; umbones flattened; umbonial slope carinate; posterior slope elevated into a carina; epidermis finely wrinkled and almost black; cardinal teeth oblique and crested, larger in the right valve; lateral teeth long and straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the beaks shallow; nacre pearly white and iridescent.

Remarks.—This species is from the Burrough collection, and is distinct from any I have seen. It resembles somewhat, in the outline of the margin, the *nasutus* of Say. The posterior slope does not, however, decline so much, the dorsal and basal margins being nearly parallel. In being subcylindrical it resembles the *cylindricus* of Say; it has not, however, either tubercles or arrow-headed markings. The very dark colour of its epidermis is peculiar.*

* Since the above description and the figure were made, I have seen a more perfect specimen in the possession of Dr Burrough, which has the beaks but little eroded. In

 UNIO COOPERIANUS. Plate VIII. fig. 21.

Testâ suborbiculatâ, nonnihil obliquâ, inequilaterâ, dimidio postico tuberculatâ; valvulis crassis; natibus prominentibus; dentibus cardinalibus subgrandibus; lateralibus subbrevis, crassis rectisque; margaritâ albâ et carnis colore tinctâ.

Shell suborbicular, somewhat oblique, inequilateral, tuberculated on posterior half; valves thick; beaks elevated; cardinal teeth rather large; lateral teeth rather short, thick and straight; nacre flesh coloured and white.

Hab. River Ohio. T. G. Lea.

My Cabinet.

Cabinet of Mr Cooper.

Diam. 1·9,

Length 2·8,

Breadth 3·2 inches.

Shell suborbicular, somewhat oblique, inequilateral, irregularly tuberculated on the posterior half; substance of the shell thick; beaks thick and elevated; ligament rather short and thick; epidermis wrinkled, dark rusty brown; rays scarcely visible; cardinal tooth rather large and widely cleft in the left valve, single and emerging from a pit in the right valve; lateral teeth rather short, thick and straight; anterior and posterior cicatrices both distinct; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks deep and angulated; nacre flesh coloured and white, the white usually forming a broad border between the pallial cicatrix and the margin.

Remarks.—This species very closely resembles, in most of its characters, both the *verrucosus* (Barnes) and *pustulosus* (nobis). It differs from the first in never being chocolate coloured. It is rarely, I believe, entirely white like the latter. The epidermis is dark, and when rays can be seen on it, they will be found to be pencilled, and not one broad

this I found a character not perceptible in the eroded one from which the description was made, the beaks being furnished with radiated folds nearly similar to those of the *lacteolus* and *Burroughianus* described herein. This character seems to prevail very much in the South American *Uniones*. Among the numerous species described from North America, none yet have been observed to possess this character.

interrupted one like the *pustulosus*. There is a great peculiarity in the flesh or pink colour of the nacre, which is disposed to be clouded, and to be of a stronger hue about the teeth, while the cavity of the beak is nearly white.

I dedicate this species to my friend, William Cooper, Esq., as a slight acknowledgement of the many favours received in the way of communications, and the loan of specimens.

UNIO EMARGINATUS. Plate IX. fig. 22.

Testâ sub-ellipticâ, ad basim emarginatâ et compressâ, transversissimâ, valde inæquilatêrâ, postice sub-triangulatâ; valvulis subcrassis; natibus prominulis, apicibus undulatis; epidermide viridi-luteâ; dentibus cardinalibus parvis, obliquis, et in valvulâ utrâque duplicibus; lateralibus longis subcurvisque; margaritâ albâ et iridescente.

Shell sub-elliptical, emarginate and compressed at base, very transverse, very inequilateral, sub-biangular behind; valves somewhat thick; beaks rather elevated and undulated at tip; epidermis greenish yellow; cardinal teeth small, oblique and double in both valves; lateral teeth long and slightly curved; nacre pearly white and iridescent.

Hab. . . .

My Cabinet.

Diam. 1, Length 1·3, Breadth 2·8 inches.

Shell subelliptical, emarginate and compressed at base, very transverse, very inequilateral, sub-biangular behind, elevated along the umbonal slope, flattened on the umbones; substance of the shell somewhat thick; beaks rather elevated, retuse and undulate at the tip; ligament long and thin; epidermis finely wrinkled, greenish yellow, along the posterior slope green; cardinal teeth small, oblique and double in both valves; lateral teeth long and slightly curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks subangular and wide; nacre pearly white and iridescent.

Remarks.—I procured two opposed valves of different individuals of this species, which nearly match, of Mr Stutchbury, a well known and

extensive dealer in London. He could not give me the least idea of its native country. From its general appearance I should presume it to come from a southern latitude, perhaps from New Holland. It is rather peculiar in its outline, being more emarginate at base than any species with which I am acquainted. The emargination is not, however, so great as in the *Mya margaritifera* (Lin.), *Alasmodonta arcuata* (Barnes). It approaches most closely the *Unio subtentus* (Say), but differs from it in the total absence of folds or "ribs" on the posterior slope. In the two valves which I possess there appear to be no rays, unless the green of the posterior slope be denominated a single broad one. The emargination and compression of the base cause the posterior part of the cavity of the shell to be effuse.

UNIO CONRADICUS. Plate IX. fig. 23.

Testâ ellipticâ, transversâ, inæquilaterâ, parte posteriori plicatâ; valvulis tenuibus; natibus ad apices nitide undulatis; dentibus cardinalibus parvis et erectis; lateralibus indistinctis; margaritâ antice albâ, postice iridescente et in cavo fusco purpureâ.

Shell elliptical, transverse, inequilateral, folded on the posterior parts; valves thin; beaks finely undulated at tip; cardinal teeth small and erect; lateral teeth not perfectly defined; nacre white anteriorly, iridescent posteriorly, and brownish purple in the cavity.

Hab. . . . Professor Troost.

My Cabinet.

Cabinet of Professor Troost.

Diam .6,

Length .8,

Breadth 1.8 inches.

Shell elliptical, transverse, inequilateral, indistinctly folded on the posterior parts; substance of the shell thin behind, thicker before; beaks slightly elevated and finely undulated at tip; ligament rather long and thin; epidermis finely wrinkled, yellowish brown, with numerous indistinct greenish rays, which on the posterior part are disposed to be clouded; cardinal teeth small, erect, disposed to be lobed; lateral teeth long, slightly curved, not perfectly defined, having but a small cleft in the left valve; anterior cicatrices distinct; posterior cica-

trices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks shallow and tinged with brownish purple; nacre white anteriorly, thinner and very iridescent posteriorly.

Remarks.—I owe to the kindness of professor Troost this little species, and name it after an indefatigable naturalist, Mr T. A. Conrad. It belongs to that group which is distinguished by an immature hinge, and which I have noticed in my remarks on the *U. Hildrethius*. The *U. Conradius* certainly resembles that shell closely. It is, however, less cylindrical, and has the teeth more perfect. It also has rays and undulations which I have not observed on the other. In outline it more closely resembles the *U. iris* (nobis), but differs in the teeth and in the rays. Having but two specimens of this species to examine, some of the characters may be found to differ in other specimens. One of these is slightly emarginate at the basal margin.

UNIO DIVARICATUS. Plate IX. fig. 24.

Testâ ellipticâ, transversâ, subcompressâ, valde inæquilatâ; valvulis tenuibus; natibus plicis pulchris divaricatis; dentibus cardinalibus parvis, compressis; lateralibus longis et subtenuibus; margaritâ albâ et iridescente.

Shell elliptical, transverse, rather compressed, very inequilateral; valves thin; beaks with beautiful divaricating folds; cardinal teeth small, compressed; lateral teeth long and rather thin; nacre white and iridescent.

Hab. Egypt. Duke de Rivoli.

My Cabinet.

Diam. .5, Length .9, Breadth 1.4 inches.

Shell elliptical, transverse, somewhat compressed, very inequilateral; substance of the shell thin; beaks covered with beautiful folds diverging from their apex; ligament rather short and slender; epidermis greenish, smooth; cardinal teeth small, compressed, double in the right valve, and single in the left; lateral teeth long, rather thin and nearly straight; anterior cicatrices slightly confluent; posterior cicatrices confluent; dorsal cicatrices situated in the centre of

the cavity of the beaks; cavity of the beaks shallow and subangular; nacre white and iridescent.

Remarks.—This beautiful little species I procured from the cabinet of the Duke de Rivoli in Paris. It appears to me to be inedited, and may perhaps have been considered a transverse variety of the *corrugatus* (Lam.). It ought not to be confounded with that species, being much more transverse, and the folds of the beaks differing. Lamarck, in his description of the *corrugatus*, says, “*rugis angulato-flexuosis.*” The folds of the *divaricatus* are well marked, without angles, and diverge from the point of the beaks.

UNIO CORRIANUS. Plate IX. fig. 25.

Testâ angusto-ellipticâ, transversissimâ, valde inæquilaterâ, postice subangulatâ; valvulis tenuissimis; natibus vix prominulis; dentibus cardinalibus tenuibus et laminatis; lateralibus longis, tenuibus, subrectisque; margaritâ albâ et iridescente.

Shell narrow-elliptical, very transverse, very inequilateral, subangular behind; valves very thin; beaks scarcely prominent; cardinal teeth thin and bladed; lateral teeth long, thin and nearly straight; nacre pearly white and iridescent.

Hab. India. Mrs Corrie.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. .6, Length 1, Breadth 2.1 inches.

Shell narrow elliptical, very transverse, very inequilateral, subangular behind; dorsal line nearly straight; substance of the shell very thin; beaks very slightly elevated and minutely waved at the tip; ligament long and slender; epidermis smooth, dark brown; rays none; cardinal teeth thin, bladed, single in the *left* valve and double in the *right*; lateral teeth long, thin, bladed and nearly straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated nearly in the centre of the cavity of the beaks; cavity of the beaks exceedingly shallow; nacre pearly white and iridescent.

Remarks.—I am indebted to an amiable and intelligent friend, Mrs Corrie of Birmingham, England, for this new species, which comes from Calcutta; and to her I dedicate it, as a mark of sincere friendship. It closely resembles the *U. marginalis* of Lamarck, but differs from that species in being more transverse, in the beaks being more retuse, in the dorsal line being nearly straight, and in its not being possessed of a light border along the margin. The cardinal teeth are remarkably thin, and form nearly a line with the lateral teeth.

UNIO GRAYANUS. Plate IX. fig. 26.

Testâ lanceolatâ, transversissimâ, antice rotundatâ et postice acutissime angulatâ, prope nates et partem posticam plicatâ; lateribus planulatis; clivo umboniali subcarinato; valvulis tenuibus; natibus prope marginem anticam locatis, depressis; epidermide luteolâ, obsolete radiatâ; dentibus cardinalibus in valvulâ utraq̃ue duplicibus et erectis; lateralibus longissimis, tenuibus, sub-erectisque; margaritâ pulchrâ et iridescente.

Shell lanceolate, very transverse, rounded before and very acutely angular behind, plicate about the beaks and posterior part of the shell, flattened on the sides; umbonial slope ridged; valves thin; beaks depressed, placed near the anterior margin; epidermis yellowish with obsolete rays; cardinal teeth double in both valves and erect; lateral teeth very long, thin and nearly straight; nacre beautifully pearly and iridescent.

Hab. China.

My Cabinet.

Cabinet of Mr Hyde.

Cabinet of Mr Gray, London.

Diam. .6,

Length .8,

Breadth 3.3 inches.

Shell lanceolate, very transverse, very inequilateral, rounded before and very acutely angular behind, irregularly folded in the region of the beaks, several larger folds on the anterior slope, on the posterior portion the folds are parallel being nearly perpendicular to the basal margin, flattened on the sides; umbonial slope elevated into a ridge, green; substance of the shell thin; beaks depressed, placed very near to the anterior margin; ligament thin, not very long; epidermis finely wrinkled, yellowish with obsolete rays, disposed to be greenish

on the posterior part; cardinal teeth double in both valves, compressed and erect; lateral teeth very long, thin and nearly straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated in the cavity of the beaks; cavity of the beaks very small; nacre beautifully pearly and iridescent.

Remarks.—This is perhaps the most extraordinary *Unio* that has yet fallen to the lot of a naturalist to describe. When we cast our eyes over all the species, and then rest them on this, we shall be ready to exclaim, that nothing hereafter belonging to this genus can astonish us. Its latitude is so great, that one at first sight can scarcely believe it to belong to the family *Naiades*. Its great transverseness causes the lateral teeth to be exceedingly long, and that character, together with the acutely angular posterior margin, gives the shell the form of a crane's beak. In outline it does not approach any species I know, and therefore there can be no comparison made. I procured it of a dealer in London, and dedicate it to my friend, John Edward Gray, Esq. of the British Museum, one of the most distinguished naturalists in Great Britain, and to whose great kindness and attention while in London I am much indebted. I know of no zoologist who has, in that country, pursued our favourite science with more ardour or more success, and it is only due to him, while it gives me great pleasure to render him this tribute of respect in placing his name to one of the most interesting species of the whole family.

UNIO BURROUGHIANUS. Plate X. fig. 27.

Testâ subrotundâ, inæquilaterali, compressâ, postice subangulatâ; natibus oblique plicatis, prominulis; valvulis subcrassis; epidermide tenebroso-fuscâ; dentibus cardinalibus magnis, elevatis et laminatis, lateralibus subrectis; margaritâ albâ et iridescente.

Shell subrotund, inequilateral, compressed, subangular behind, with oblique folds on the beaks; valves rather thick; beaks somewhat elevated and much plicate; epidermis dark brown; cardinal teeth large, elevated and lamelliform; lateral teeth nearly straight; nacre pearly white and iridescent.

Hab. River Parana, Province of Corrientes. Dr Burrough.

My Cabinet.

Cabinet of Dr Burrough.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. .1, Length 1.8, Breadth 2.4 inches.

Shell subrotund, inequilateral, compressed, subangular behind, with large oblique folds on the beaks; substance of the shell rather thick; beaks somewhat elevated and distinctly plicate as far as the umbones; ligament short and thin; epidermis smooth, dark brown with transverse yellow marks of growth; cardinal teeth large, elevated, lamelliform and double in both valves; lateral teeth lamelliform and nearly straight; anterior cicatrices and posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks subangular and shallow; nacre pearly white and iridescent.

Remarks.—This is of the collection of Dr Burrough, sent by him to the Academy of Natural Sciences of Philadelphia. To this gentleman natural science is much indebted for his unwearied industry in contributing to the knowledge of the Fauna—of the numerous countries through which he has travelled, in Asia, as well as on this continent. This species resembles most, perhaps, the *lacteolus* (nobis), but differs from it in being more round in the outline, in having longer and larger folds on the beaks, and in being more compressed. In the beaks it has some resemblance to the *corrugatus* (Lam.), as well also as in the outline; but the folds being nearly parallel to each other, it differs from the *corrugatus* in these, which are usually zig zag in the latter shell. I owe to the kindness of Dr Burrough the specimen in my cabinet, and I have great pleasure in dedicating the species to him.

UNIO SOWERBIANUS. Plate X. fig. 28.

Testâ subtriangulari, inflatâ, parte posticâ peculiariter compressâ et striatâ; valvulis crassissimis; natibus valde prominentibus, dentibus cardinalibus magnis; lateralibus crassis subrectisque; margaritâ in cavo albido-purpureâ.

Shell subtriangular, inflated, singularly compressed on the posterior part, which is striate ; valves remarkably thick ; beaks very prominent ; cardinal teeth large ; lateral teeth thick and nearly straight ; nacre in the cavity very light purple.

Hab. Tennessee. G. B. Sowerby.

My Cabinet.

Cabinet of Mr Sowerby.

Diam. 1·5, Length 1·7, Breadth 1·8 inches.

Shell subtriangular, inflated, singularly compressed on the posterior part, which is filled with striæ passing from the beak to the posterior and posterior-basal margins, the anterior part being inflated and smooth ; slightly emarginate at posterior basal margin ; substance of the shell very remarkably thick, less so on the posterior part ; beaks large and very prominent ; ligament short and thick ; epidermis bright brown, smooth and shining before, striate behind ; cardinal teeth large, sulcate, elevated and cleft in the left valve, and emerging from a pit in the right valve ; lateral teeth thick, short and nearly straight ; anterior and posterior cicatrices both distinct ; dorsal cicatrices situated on the under part of the cardinal teeth ; cavity of the beaks shallow and subangular ; nacre very light purple in the cavity, and white on the anterior margin.

Remarks.—To the kindness of G. B. Sowerby, Esq., one of the most distinguished writers on conchology in England, I owe the possession of this truly interesting shell, and to him I with great pleasure dedicate it. He received it from the state of Tennessee, but from what river I do not know. In general outline it resembles somewhat the *trigonus* (nobis), but differs from it in being more rotund, in having the posterior part compressed and striate, and in being coloured inside. It has a stronger resemblance to the *Haysianus* (nobis) than to any other species known to me, but differs from it in being more compressed behind, in being more striate, in being much larger (to judge from the few specimens I have seen of both), and in the difference of the colour of the nacre, the *Haysianus* being dark chocolate, while the *Sowerbianus* is of a very light purple, approaching to flesh colour.

UNIO DROMAS. Plate X. fig. 29.

Testâ subtriangulari, subobliquâ, gibbâ, irregulariter transversimque plicatâ, punctiunculis passim radiatâ; valvulis crassissimis; natibus prominentibus; dentibus cardinalibus latis, lateralibus crassis brevibusque; margaritâ albâ.

Shell subtriangular, somewhat oblique, hunch-backed, irregularly and transversely folded, with dotted rays over the whole disk; valves very thick; beaks elevated; cardinal teeth wide; lateral teeth short and thick; nacre pearly white.

Hab. Harpeth River, Tennessee. Professor Conrad.

Hab. Cumberland River, near Nashville. Professor Troost.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Professor Troost.

Cabinet of P. H. Nicklin.

Diam 1·6, Length 1·8, Breadth 1·9 inches.

Shell subtriangular, somewhat oblique, hunch-backed, irregularly and transversely folded at the separate stages of growth, furnished with an oblique furrow before the umbonial slope, substance of the shell very thick; beaks thick and elevated; ligament short, thick and dark coloured; umbones furnished with a hump; epidermis yellow, with numerous dark green dotted rays, on the anterior part furnished with about six somewhat broad rays; cardinal tooth wide and sulcate; lateral tooth short and thick, having a flat plate between it and the cardinal tooth; anterior and posterior cicatrices both distinct; dorsal cicatrices situated on the under side of the cardinal tooth; cavity of the beaks deep and angulated; nacre pearly white, on the posterior part sometimes golden.

Remarks.—I have had for some years in my cabinet two specimens of this beautiful and curious species, the first of which, a young one, I owe to the kindness of the late professor Conrad. Having recently received a complete suite from professor Troost, I have perfectly satisfied myself of (what I before doubted) its being distinct from the *irroratus* (nobis). The manner in which the hump is formed is very remarkable. As far as the third or fourth stage of growth the disks

are almost flat. The deposit of the nacre after this forms an angle of nearly 45° with the surface which it has left, thus forming a hump, or obtuse angle point, directly on the umbo. This causes the curious result, that when the shell is from one third to three fourths grown, it will rest, when so placed, on the portion of surface between the point of the beak and the umbo, the basal margin remaining in the air. In its general characters it resembles the *irroratus*, but may at once be distinguished by the hump. It is devoid of tubercles, while the *irroratus* is sometimes covered with them, particularly on the posterior part. It differs somewhat also in the rays, the spots in those of the *dromas* being larger, and generally better defined. The outline differs in being less elongated, being disposed to be more oblique or more transverse. In regard to the structure of the animal, I am not prepared to say that it differs from that of the *irroratus*.* Not having had an opportunity to examine the animal, I can only judge by analogy, which would, I think, induce one to conclude that the same curious pendent oviducts would be found in both. I hope to be able to procure from professor Troost a specimen in that period of gestation.



UNIO TROOSTENSIS. Plate X. fig. 30.

Testâ scalenâ, cuneatâ, obliquâ, valde inæquilaterali; valvulis antice crassioribus; natibus subterminalibus; epidermide luteolâ, radiis capillaribus multis; dentibus cardinalibus elevatis, cristatis; lateralibus subrectis; margaritâ albâ et iridescente.

Shell scaleniform, wedge shaped, oblique, very inequilateral; valves thicker anteriorly; beaks nearly terminal; epidermis yellowish, filled with numerous capillary rays; cardinal teeth elevated, crested; lateral teeth nearly straight; nacre pearly white and iridescent.

Hab. Cumberland River. Professor Troost.

My Cabinet.

Cabinet of Professor Troost.

* See vol. iii. p. 271.

Diam. .8, Length .1, Breadth 1.9 inches.

Shell scaleniform, cuneated, oblique, very inequilateral, angular behind; substance of the shell thick before, thinner behind; beaks elevated and rounded; epidermis very finely wrinkled, shining, yellowish brown with numerous green flexuous capillary rays over the whole disk; ligament rather short and thick; cardinal teeth elevated, crenate, deeply cleft in the left valve, and emerging from a pit in the right valve; lateral teeth long and nearly straight; anterior cicatrices distinct; posterior cicatrices nearly distinct; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the beaks very shallow; nacre beautifully pearly white and iridescent.

Remarks.—I owe to the great kindness of professor Troost the examination of his select specimens, which he most obligingly sent to me for that purpose. Among them were two specimens of this rare and beautiful species, unsurpassed by any other in the delicacy and exquisite beauty of its rays. In general form it approaches the *scalenius* (Rafinesque), but differs from it in the form of the rays altogether. It differs also in colour and in having the beaks less retuse. In dedicating this rare and beautiful species to my friend, professor Troost, I do him but an act of simple justice. His constant efforts in the promotion of the physical sciences are known and acknowledged, and his investigation in this branch of conchology will do much to illustrate its history in his adopted state.

UNIO PERDIX. Plate XI. fig. 31.

Testá ellipticâ, postice subangulatâ, subæquilateralî, inflatâ, transversâ; valvulis subcrassis; epidermide luteolâ, radiis irregulariter interruptis; dentibus cardinalibus elevatis; lateralibus prope eorum fines majoribus; margaritâ albâ et iridescente.

Shell elliptical, subangular behind, nearly equilateral, inflated, transverse; valves rather thick; epidermis yellowish with irregularly interrupted rays; cardinal teeth elevated; lateral teeth larger near their termination; nacre pearly white and iridescent.

Hab. Harpeth River, Tennessee. Professor Troost.

My Cabinet.

Cabinet of Professor Troost, Nashville.

Diam. 1·4, Length 1·9, Breadth 3·1 inches.

Shell elliptical, subangular behind, nearly equilateral, inflated, transverse; substance of the shell rather thick; beaks slightly elevated and without undulations at tip; ligament short and thick; epidermis yellowish with irregularly interrupted rays over the whole disk; cardinal teeth elevated, double in the left valve and single in the right; lateral teeth enlarged and disposed to be bladed at the termination; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated along the base of the cardinal tooth and under the plate between the cardinal and lateral teeth; cavity of the beaks wide and obtusely angulate; nacre pearly white, extending only far enough to leave a broad horn coloured border.

Remarks.—This species was among the shells sent to me by professor Troost. To judge from the few specimens I have seen, I should suppose it varied much from age as well as locality. One of my specimens is old and very large, scarcely presenting a ray. In this state it closely resembles the *U. obovatus* (nobis), but is rather more transverse. The younger and more perfect specimens approach more closely to the *U. crassus* (Say), but are more inflated, and differ in the rays, which are broken into irregular spots, not entirely dissimilar to the plumage of the partridge. It has some resemblance to the *U. pictus* herein described, but is not compressed like that species, and differs in the rays. In some specimens the teeth are disposed to be pinkish.

UNIO PICTUS. Plate XI. fig. 32.

Testâ ellipticâ, compressâ, inæquilaterali; valvulis subtenuibus; natibus compressis et ad apices undulatis; epidermide luteâ, radiis tenebroso-viridibus interruptis; dentibus cardinalibus parvis; lateralibus longis et subcurvis; margaritâ albâ et iridescente.

Shell elliptical, compressed, inequilateral; valves rather thin; beaks compressed and undulated at tip; epidermis yellow with interrupted dark green rays; cardinal teeth small; lateral teeth long and slightly curved; nacre pearly white and iridescent.

Hab. Harpeth River, Tennessee. Professor Troost.

My Cabinet.

Cabinet of Professor Troost.

Diam. .8, Length 1.6, Breadth 2.6 inches.

Shell elliptical, compressed, inequilateral; substance of the shell rather thin, thicker before; beaks compressed and finely undulated at the tip; ligament short and rather thick; epidermis fine yellow with numerous oblique interrupted rays, which are strongly pencilled at the commencement of each stage of growth; cardinal teeth very small and erect; lateral teeth long and slightly curved, in the left valve enlarged near the termination; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks, and deeply impressed; cavity of the beaks very shallow and rounded; nacre pearly white and iridescent.

Remarks.—This species, so beautiful and so peculiar in its painted exterior, I owe to the kindness of professor Troost. The fine specimen figured belongs to the museum of that gentleman in Nashville, and I am indebted to him for the loan of it to insert it here. It belongs to a group, the peculiar character of which seems to be in the singular interruption of the rays, which are obsolete, except at the commencement of each stage of growth, where they are strongly pencilled with green. The *U. planulatus* (nobis), *U. patulus* (nobis) and *U. perdix* (herein described) belong to this group. The *U. pictus* has some resemblance to the *U. cariosus* (Say), but differs in being more compressed, and in having rays over the whole disk. It perhaps more closely resembles the younger specimens of *U. crassus* (Say). It differs, however, in being thinner, smaller, and in the character of the rays.

SYMPHYNOTA DISCOIDEA. Plate XI. fig. 33.

Testâ subrhombed, compressâ, transversâ, inæquilaterali, valvulis tenuissimis, postice connatis; natibus paulum undulatis, compressis; dentibus in valvulâ utrâque lineam simplicem facientibus; margaritâ albâ et iridescente.

Shell subrhomboidal, compressed, transverse, inequilateral; valves very thin, connate behind; beaks slightly undulated, compressed; teeth in both valves forming a simple line; nacre white and iridescent.

Hab. . . . * G. B. Sowerby.

My Cabinet.

Cabinet of Dr Burrough.

Cabinet of W. Hyde.

Diam. 1·2,

Length 2·4,

Breadth 3·9 inches.

Shell subrhomboidal, compressed, transverse, inequilateral, finely wrinkled; substance of the shell very thin; posterior slope elevated into a moderately high wing, which is connate; beaks very slightly undulated, compressed; ligament linear; epidermis dark brown; teeth in both valves forming a simple, continuous, fine curve line; anterior and posterior cicatrices both distinct; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the beaks almost none; nacre white and iridescent.

Remarks.—I owe to the kindness of G. B. Sowerby, Esq. the specimen here described. He procured it of “a dealer from Holland,” and its habitat is unknown. It has the characters of an eastern shell, and probably came from Java. In the outline of the margin it resembles the *Symphynota magnifica* (described in this memoir), but differs from it in being compressed and in the possession of teeth. In the teeth it has a stronger resemblance to the *S. bialata* (nobis) than to any other species. It is, however, less defined, and the curve is less regular, the posterior portion being nearly straight. In the elevation of the wing it differs totally. Our present shell forms an interesting

* Dr Burrough has recently obtained it in the rivers of China, and to him I owe the fine specimen figured.

link in the gradual change of the characters of the teeth. It approaches that division of the *Naiades* which do not possess teeth, more closely than any species which has come under my notice.

ANODONTA LATO-MARGINATA. Plate XII. fig. 34.

Testâ obovatâ, transversâ, inæquilaterali; intus margine latâ et corneâ; sinu longo et in partem internam disci vergente; valvulis crassis; epidermide rubidofuscâ; margaritâ albâ et iridescente.

Shell obovate, transverse, inequilateral, interior with a broad horn coloured border; sinus long, and pointed towards the interior of the disk; valves thick; epidermis reddish brown; nacre pearly white and iridescent.

Hab. River Parana, South America. Dr Burrough.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. 1·5, Length 2·5, Breadth 3·5 inches.

Shell obovate, transverse, inequilateral, inflated, interior with a broad horn coloured border; sinus long, and pointed to the interior of the disk; substance of the shell thick; beaks somewhat elevated; ligament long and thick; epidermis reddish brown, finely wrinkled, and sometimes obscurely rayed; anterior cicatrices distinct; posterior cicatrices confluent; pallear cicatrices almost imperceptible; dorsal cicatrices apparently none; cavity of the beaks shallow and subangular; nacre pearly white and iridescent, extending only to the broad horn coloured border.

Remarks.—In the collection of Dr Burrough there are several specimens of this species, some of which are young and more rotund than that figured here. It presents several characters unusual in the species of this genus, so far as our knowledge extends. The horn coloured border is even broader than that of the *tenebricosa* herein described, and the apparent absence of the dorsal cicatrices I have never noticed before in any species of the family. The sinus of this species is very remarkable, as well as that of the *tenebricosa*. It does not, however,

like that species, curve towards the cavity of the beaks; it stretches in a point towards the centre of the cavity of the disk. In general outline it resembles the *An. Patagonia* (Lam.), but differs in being less rotund, less inflated, and in the nacre being white.

ANODONTA BLAINVILLIANA. Plate XII. fig. 35.

Testâ ovatâ, inflatâ, valde inæquilaterali, antice angulatâ, postice latissimâ, ad marginem anteriorem hianti; cicatrice marginali latâ et postice valde incurvâ; valvulis subcrassis; natibus prominulis; margine dorsali rectâ; margaritâ salmonis colore tinctâ.

Shell ovate, inflated, very inequilateral, angular before, very wide posteriorly, gaping at the anterior and posterior margins; pallial cicatrix broad and much incurved posteriorly; valves rather thick; beaks somewhat prominent; dorsal line straight; nacre salmon and pearly.

Hab. Chili?

My Cabinet.

Diam. 1·3,

Length 1·9,

Breadth 3 inches.

Shell ovate, inflated, very inequilateral, angular before, very wide posteriorly, the greatest length being perpendicular from the extreme posterior end of the ligament to the basal margin, gaping much at the anterior margin, and rather less at the posterior margin; substance of the shell somewhat thick; beaks rather prominent; dorsal line straight, having a slight elevation under the beak like an incipient tooth; anterior cicatrices complicated but distinct; posterior cicatrices wide and confluent; dorsal cicatrices numerous and stretched in a line across the cavity of the beaks; marginal cicatrix wide, deep and much incurved near to the posterior cicatrix; nacre salmon, beautifully pearly and iridescent.

Remarks.—I accidentally met with this interesting shell at a shop in Havre last October, a few days previously to my embarkation. The two valves belong to different individuals, but they very nearly match. They have both been slightly mutilated by an attempt to *beautify*

them, the epidermis having been almost completely removed. What remains indicates it to be greenish, and is sufficient to warrant its being represented in the figure with a perfect epidermis—the ligament has also been destroyed. I was informed by the dealer that it came from Chili; such authority cannot, however, be entirely relied on. The cicatrices of this interesting species are very remarkable, particularly that of the mantle near the margin; the palleal impression is wide, deeply impressed, and in the posterior part of the shell deflected towards the centre of the cavity, somewhat similar to the excavation of the palleal cicatrix of the genera *Galathea* and *Mactra*. The character of this cicatrix is different from that of any species of the family *Naiades* I have seen, and this peculiarity induces me to believe that the animal, when found, may prove to be different from that of the *Anodonta*. Should this be the case, it will belong of course to a new genus, for which I propose the name of *Columba*. It somewhat resembles the *An. exotica* (Lam.). It is, however, narrower before and broader behind than that shell. It gapes anteriorly and posteriorly more than any of the *Naiades* with which I am acquainted. It is perhaps most nearly allied to the *Anodon crassus* (Swainson), but differs in the dorsal line being straight, the nacre being pearly salmon, as well also in the peculiar character of the palleal cicatrix.

ANODONTA TENEBRICOSA. Plate XII. fig. 36.

Testâ ellipticâ, transversâ, inæquilaterâ, intus margine latâ et cornedâ; sinu incurvo; valvulis crassis; epidermide tenebroso fuscâ; margaritâ albâ subcæruleâ purpurâ nubilâ, iridescente.

Shell elliptical, transverse, inequilateral, interior with a broad horn coloured border; sinus incurved; valves thick; epidermis dark brown; nacre pearly white, clouded with bluish purple, iridescent.

Hab. River Parana, South America. Dr Burrough.

My Cabinet.

Cabinet of Dr Burrough.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. 1·5, Length 1·9, Breadth 3·3 inches.

Shell elliptical, transverse, inequilateral, with a broad horn coloured border, emarginate at base; sinus incurved; substance of the shell thick; beaks scarcely prominent; ligament long and thick; epidermis dark olive brown, wrinkled, obscurely rayed on the posterior slope; anterior cicatrices distinct; posterior cicatrices confluent; palleal cicatrix large and partially tinted with bluish purple; dorsal cicatrix situated in the centre of the cavity of the beaks; cavity of the beaks very shallow; nacre pearly white clouded with bluish purple, extending only to the broad horn coloured border, iridescent.

Remarks.—This curious species is from the collection sent to the Academy of Natural Sciences by Dr Burrough. It differs distinctly from any species known to me. The horn coloured broad border, and the absence of nacreous matter on this part is very remarkable, as is also the close approximation to a perfect ellipsis, the posterior and anterior margins being nearly of the same curve. The clouded bluish purple colour I have never seen in the nacre of any other species. The sinus is so peculiar in the two specimens examined, that I would impress it as important in the character of this species. In the *An. exotica* (Lam.), a South American species, the sinus is generally of the form of an equilateral triangle, the inferior angle being sharp and well defined. In the present species the sinus is still more remarkable, curving in towards the cavity of the beak and terminating with quite an acute angle. The line of the opening of the two specimens is curved and not a plane, as usual with the *Naiades*; and the right beak and margin anterior to it, overwrap in a small degree the left beak and valve. In the old specimen this extension of the margin passes the other more than an eighth of an inch—consequently the shell might almost be said to be inequivalve. In its general characters this species most resembles the *sinuosa* of Lamarck.

ANODONTA MORTONIANA. Plate XIII. fig. 37.

Testâ subellipticâ, postice sub-biangulatâ, transversâ, valde inæquilaterali ; valvulis crassis ; epidermide perfusâ ; clivo umboniali sulcato ; margaritâ argenteâ et iridescenti.

Shell subelliptical, sub-biangular behind, transverse, very inequilateral ; valves thick ; epidermis intensely brown ; umbonial slope furrowed ; nacre silvery and iridescent.

Hab. River Parana, South America. Dr Burrough.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Dr Burrough.

Diam. 1·2,

Length 1·6,

Breadth 3 inches.

Shell subelliptical, sub-biangulate behind ; transverse, very inequilateral, somewhat inflated, furrowed from the beak to the posterior margin along the umbonial slope ; substance of the shell thick ; beaks retuse and scarcely prominent ; ligament long and narrow ; epidermis intensely brown and finely wrinkled ; anterior cicatrices distinct ; posterior cicatrices confluent ; dorsal cicatrices apparently none ; cavity of the beaks subangular and shallow ; nacre silvery white and iridescent.

Remarks.—A single specimen of this species, which is distinct from any described *Anodonta* I have seen, was sent to the Academy by Dr Burrough. It is remarkably thick, silvery and iridescent, and has an exceedingly dark epidermis. It most resembles, perhaps, the *elongatus* of Swainson. It is less transverse than that shell, rounded only anteriorly ; it differs in not having “a strong flesh coloured tinge,” and is by no means so bright a brown as his beautiful figure.

Named after S. G. Morton, M.D., corresponding secretary of the Academy of Natural Sciences of Philadelphia.

MELANIA ACULEUS. Plate XIX. fig. 72.

Testâ acuto-elevatâ, lævissimâ, tenebroso-cornêd; apice acutissimo; anfractibus circiter duodecim, subconvexis; labro expanso.

Shell acutely elevated, very smooth, dark horn colour; apex very acute; whorls about twelve, somewhat convex; labrum spread out.

Hab. Java?

My Cabinet.

Diam .6,

Length 2 inches.

Remarks.—I purchased this, with some other of the shells described in this memoir, from the collection brought from Java by Mr Shillaber. It is remarkable for its attenuated form and tapering spire. It is more than usually spread out at the base. The substance of the shell is thin and bluish white. The last whorl is much enlarged. The aperture occupies about one-third of the length of the shell.

LYMNÆA IMPERIALIS. Plate XIX. fig. 73.

Testâ ovato-ventricosâ, pellucidâ, tenuissimâ, albido-cornêd, subcoronatâ; apice obtuso; anfractibus quaternis, inflatis, ultimo maximo; aperturâ magnâ, ovatâ; labro valde extenso.

Shell ovato-ventricose, diaphanous, very thin, light horn colour, subcoronate; apex obtuse; whorls four, inflated, the last very large; aperture large, ovate; outer lip much extended.

Hab. South America?

My Cabinet.

Diam. .9,

Length 1.4 inches.

Remarks.—I accidentally met with this rare and interesting shell at a dealer's in Paris. I saw no other specimen in any of the great collections in Europe. The person from whom I obtained it informed me it came from South America. It is more inflated than any spe-

cies with which I am acquainted; but what eminently distinguishes it is the subcoronate apex which, as far as we yet know, is peculiar to this species. The body whorl nearly envelopes the superior ones. When examined by the microscope, transverse striæ are observed to cause numerous minute depressions on its surface.

MELANOPSIS PRINCEPS. Plate XIX. fig. 74.

Testâ acuto-elevatâ, lævi, rufo-fuscâ, obsolete multimaculatâ; inferiori anfractu carinato, dimidio basali transversim striato; apice acuto; anfractibus plus minus quatuordecim, planis; aperturâ quintâ parte testæ.

Shell acutely elevated, smooth, transversely striate on the lower half of the body whorl, which is carinate, reddish brown, with numerous indistinct spots; apex acute; whorls about fourteen, flat aperture one-fifth the length of the shell.

Hab. Cape of Good Hope.

My Cabinet.

Diam. .6,

Length 2.1 inches.

Remarks.—This is the most remarkable species of the genus which I have examined. It differs from any described species in its great elevation, in the flatness of its whorls, in its being covered with indistinct spots, and in the absence of a large callus on the superior part of the inner lip, as well also as in the great number of its whorls. The spots are peculiar in being chain-like, alternately darker and lighter. The operculum is horny, like that of the genus *Melania*.

MELANOPSIS MACULATA. Plate XIX. fig. 75.

Testâ fusiformi, tenebroso-olivaceâ, intus fasciatâ; epidermide maculatâ; anfractibus quaternis; basi subtruncatâ; columellâ sine callo superno.

Shell fusiform, dark olive, banded on the inside, and spotted in the epidermis; whorls four; base but slightly truncate; columella not thickened above.

Hab. Peru. Lieutenant Humphreys.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. .3,

Length .5 inches.

Remarks.—The genus *Melanopsis*, a few years since, presented, to our knowledge, only two species. These were described by Lamarck. The rapid advancement of our science has recently brought to light many new ones. I have eight species in my own cabinet, and in this memoir I add two species to the ten now known. These two are peculiarly and beautifully spotted in the epidermis. The two specimens brought by lieutenant Humphreys have each four transverse purple bands on the inside, and the dark olive epidermis is filled with very distinct intensely dark brown quadrate spots. This species, and the *princeps* herein described, form a division in the genus *Melanopsis* of Lamarck which genus should be altered, leaving out the character of the callus on the upper part of the columella. Neither of these has that character, but, notwithstanding, should not be removed to a new genus, as it is, independent of that, a perfectly natural one.

AURICULA FUSCAGULA. Plate XIX. fig. 76.

Testâ fusiformi, albidâ, pellucidâ; suturis impressis et albo-lineatis; labro late reflexo; gulâ fuscâ et dentibus novenis munitâ.

Shell fusiform, whitish, diaphanous; sutures impressed and presenting a white line; outer lip widely reflected; throat dark brown and furnished with nine teeth.

Hab. Brazil.

My Cabinet.

Cabinet of P. H. Nicklin.

Diam. .4,

Length 1.1 inches.

Remarks.—This is a very remarkable and interesting species. In its general form and aperture it resembles a *Clausilia*. Like some species of that genus its mouth is studded with teeth. Of the nine,

seven are on the outer lip—the last of these and the first on the columella are the largest. The deep brown of the throat is visible through the shell. In some specimens there is a finely mottled appearance over the lower whorls of the shell. The white line along the suture is placed on the upper part of the whorl. The outline of the shell is remarkably fusiform.

CYCLOSTOMA STRIATA. Plate XIX. fig. 77.

Testâ depressâ, planulatâ, multistriatâ, albâ, pellucidâ, latissime umbilicatâ; anfractibus quaternis; apice acuminato, rufo; labro acuto; operculo corneo tenuique.

Shell depressed, flattened, much striate, white, translucent, very widely umbilicate; whorls four; apex red and pointed; lip sharp; operculum thin and horny.

Hab. Peru. Lieutenant Humphreys.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. .9,

Length .5 of an inch.

Remarks.—This shell was brought by lieutenant Humphreys from South America, and presented, with many other fine specimens, to the Academy. It resembles the *C. Jamaicensis* (Fer.); but is much larger, and has finer striæ. The rotundity of the mouth is slightly modified by the junction of the superior part with the columella.

ACHATINA VANUXEMENSIS. Plate XIX. fig. 78.

Testâ fusiformi, tenui, pellucidâ, longitudinaliter et transversim striatâ, luteâ, in anfractum infernum obsolete albo-maculatâ; suturis granulatis; canali baseos curvo.

Shell fusiform, thin, pellucid, longitudinally and transversely striate, ochre coloured, with indistinct white spots on the body whorl; sutures granulate; channel curved at the base.

Hab. Mexico. Professor Vanuxem.

My Cabinet.

Cabinet of Professor Vanuxem.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of P. H. Nicklin.

Diam. 1·2,

Length 2·5 inches.

Remarks.—Among the shells brought from Mexico by professor Vanuxem, was this fine *Achatina*, which belongs to Lamarck's second division of this genus. It very closely resembles the *Buccinum striatum* (Chem.), *Polyphemus glans** (Say), *Glandina* (Say). It differs from it in having crenulated sutures, and in having fine transverse lines, as well as longitudinal striæ. The indistinct opaque white spots, which are more frequent on the front of the body whorl, are, I believe, peculiar to this species. It is larger by one-third than any individual of the *striata* which I have seen.

In concluding these descriptions and observations, I will take advantage of the opportunity to express my thanks to those gentlemen who have kindly assisted me with new shells and rendered other friendly offices. Among these I have been particularly obliged by Philip H. Nicklin, Esq., William Cooper, Esq. and professor Troost. To the Academy of Natural Sciences of Philadelphia an acknowledgment is due, for the liberal and unhesitating vote which it passed, to permit me to describe for our Transactions the new species in their splendid and highly useful collection.

I will take this opportunity also to correct the habitat of the *Unio brevidens* (Vol. IV. page 75), which professor Troost thinks has not been found in the Ohio, but only in the Cumberland. The specimen which Mr Cooper kindly gave to me to be described, came, I believe, originally from professor Troost. The specimen figured was not more than half grown. The older individuals usually have an arched ridge along the

* *Cochlicopa rosea* (Fer.). It should now be called *Achatina striata*, unless the generic name be changed, the propriety of which I doubt.

umbonial slope near to the margin, the edges of each growth being there dentate. In some specimens this is so strongly marked as to resemble a thick cord. The *Arcæformis*, professor T. doubts being in Tennessee river. He found it only in the Cumberland. He was, I believe, the first person who sent this species to New York and this city. Some fine old specimens, recently received from that gentleman, exhibit a diameter of a most extraordinary nature, as well also an almost perfect flatness of the posterior slope. My oldest specimen, when placed on a plane, will rest both on the base and on that slope. The specimen figured by me, was not more than two-thirds grown, and was then the best specimen I had seen, and I supposed it to be an adult.

OBSERVATIONS ON LAMARCK'S NAIADES.

HAVING had the opportunity while in Paris recently, to inspect most of the cabinets to which Lamarck refers in his description of the *Naiades*, I seized the opportunity to examine the *individual specimens* from which he made his descriptions; and having made notes on the spot, I feel great confidence as to the facts, and trust that my judgment as to the decisions on his species will be found to be correct.

In pointing out the errors of this great zoologist, we must not be astonished at their number, nor should the slightest shadow fall upon his merited and exalted reputation. We should rather think of the means within his power, the poverty of the materials with which he worked, and above all, the unfortunate ophthalmia which afflicted his declining years, and which he deplores in the advertisement of the sixth volume of his *Hist. Nat. des Animaux sans Vertèbres*.

Unio sinuata. This is a true species, but Klein is entitled to the name which he gave first to it, viz. *crassissima*.* It has been considered by the conchologists of this country (and I certainly was of the

* See Transactions of the Linnean Society of Bourdeaux, Vol. II. p. 42.

same opinion) to be the *Mya margaritifera* of Linnæus. It has all the characters of this species, with the exception of the addition of the thick lateral tooth, which our author does not describe, but could scarcely have failed to have observed. Being possessed of this tooth, it is of course a true *Unio*. Pfeiffer describes an old *margaritifera* under the name of *sinuata*. He says "dente cardinali valido, subconico, laterali nullo." In the north of Europe, (for the *sinuata* exists only in the south) he had not, perhaps, like ourselves, until recently, an opportunity of examining the true *sinuata* of Lamarck.

Unio elongata. This is the true *Mya margaritifera* of Linnæus and other authors. The *Alasmodonta arcuata* of Barnes is its analogue in this country. It inhabits the north of Europe, lake Ladoga, Norway, &c.

Unio crassidens. The specimen quoted from Lamarck's own collection, which is now in the possession of the Duke de Rivoli, is the *cuneatus* of Barnes. Var. *a* is the *trapezoides* (nobis), a shell very different in its general characters, being always folded. *Crassidens* therefore has precedence of *cuneatus*.

Unio Peruviana. This is the *plicatus* of Le Sueur, now so well known in all our collections. Valenciennes says, Dombey's shell remains in the museum, and that Lamarck described a North American shell in error. The figure referred to by Lamarck, in the Ency. Methodique, is certainly the well known *plicatus* of our western waters.

Unio purpurata. Lamarck supposed the specimens he examined to have come from Africa. I examined the specimen cited, in the Duke de Rivoli's collection, as well, also, one in that of Baron de Ferussac. These specimens have been polished, and have, most probably, been in the cabinet of Paris for twenty or thirty years; for, few *Uniones* were admitted into the cabinet, at that time, without the loss of their superficial protection. It is the *ater* (nobis), and, most probably, was taken from the neighbourhood of New Orleans, while in possession of the French. The specimen described and figured in one of my former memoirs, came from Port Gibson, below Natchez; and I subsequently received some from the vicinity of New Orleans and from Claiborne, Alabama. I therefore, willingly yield the name to Lamarck.*

* In the "American Conchology," No. V., Mr Say re-describes and re-figures the *Unio*

Unio ligamentina. The specimen in the Garden of Plants is the *U. crassus* of Say.

Unio obliqua, in the same collection is the *U. undatus* of Barnes.

Unio retusa. This is the *U. torsus* (Rafinesque). The locality given is Nova Scotia; the correctness of which I doubt much. It is, as yet, known to exist only in our western waters.

Unio rarisulcata. The specimen in the Garden of Plants is the *complanatus* (Soland.), *purpureus* of Say.

Unio coarctata. The specimen in the collection of the Duke de Rivoli is the *complanatus* (Soland.). The observation of Lamarck, that "it is the analogue of our *U. margaritifera*," (he ought to have said *elongata*, for he does not use the name of *margaritifera*) must be an error. The American shell, described by Barnes as *Alasmodonta arcuata*, is the unquestionable analogue of the true *Mya margaritifera* (Linn.), and a very different shell, not having a lateral tooth, and belonging to Schumacker's genus *Margaritana* (Say's *Alasmodonta*).

Unio purpurascens. This is also a *complanatus*, in the museum of the Garden of Plants.

Unio radiata. The specimen at the Garden of Plants is the true *radiatus*. The *Unio ochraceus* (Say), given as a synonyme, is a very distinct species.

Unio brevisalis. The specimen at the Garden of Plants resembles so closely the *U. littoralis*, that I am induced to believe it never came from the Isle of France, and that it is of European origin. That in Baron de Ferussac's cabinet is certainly an old *littoralis*. The shell figured by Crouch, under the name *brevisalis*, is entirely distinct.

Unio rhombula. The specimen now in the cabinet of the Duke de Rivoli* is a young and bad specimen of the *complanatus*, and certainly from the United States, and not Senegal. Var. *b*, in the cabinet of Valenciennes, I did not see.

ater, under the name of *U. lugubris*, alleging that the name *ater* is "preoccupied by Nilsson for a very distinct species." Mr S. does not seem to be aware, that Nilsson's *ater* is only a variety of *U. Batava*, of Maton and Racket; and, therefore, could not affect my claim. We must both yield to the prior claim of Lamarck.

* I ought to say that the Duke keeps the cabinet of Lamarck intact, as much as possible, and, therefore, the shells quoted may be relied on as being the same as described by Lamarck.

Unio carinifera is also the *complanatus*, which inhabits so large a space of our country east and west of the Alleghany mountains.

Unio Georgina is also from the mine *complanatus*.

Unio clava. This is the *scalenia* of Rafinesque: *modioliformis* of Say.

Unio recta is Barnes's *prælongus*. Lamarck has precedence.

Unio naviformis. This is the *cylindricus* of Say, who has precedence.

Unio glabrata. This is the *complanatus*. The specimen in the Duke de Rivoli's cabinet is most likely from our eastern waters.

Unio nasuta. The specimen from which this description was made, is now in the museum of the Garden of Plants. It is a young *gibbosus* of Barnes. It is not the same with Say's *nasutus*, as Lamarck suspected it to be. As Lamarck described the shell before Barnes, he has a claim for the species; but having used a name pre-occupied by another shell, he loses it. I therefore would continue Mr Barnes's name *gibbosus*.

Unio ovata is the *ovatus* of Say. Var. *b*, I was not enabled to see—from the description I presume it to be a variety of *occidens* (nobis).

Unio rotundata. The specimen shown to me by Baron de Ferussac, whose cabinet is cited for one of the two specimens seen by Lamarck, is a small *suborbiculata* (Lam.), a large specimen of which the baron had the goodness to give me, and I have reason to believe it to be the individual cited by Lamarck. It is the *subglobosus* (nobis), and the *glebulus* of Say.

Unio littoralis. This interesting species inhabits most parts of Europe. It has been brought also from the Tigris by some of the French scientific expeditions, and I owe to the kindness of the administration of the Garden of Plants a fine specimen from Bagdad. The specimens from this locality are less transverse, and Lamarck considered the difference sufficient to found a species, *semirugata*, by which name they are labelled in that institution. After examining carefully suites from Europe and Asia with Baron de Ferussac, he accorded with me in opinion, that there was not sufficient difference to warrant their separation.

After examining numerous specimens in Europe of the *littoralis*, I have strong doubts if the shell described by me in a former memoir, under the name of *incurvus*, be not a peculiar variety of it. It certainly has a marked similarity to a fine transverse specimen of *littoralis*. The specimen from which my description was made, was sent to me as a "non descript from Gibraltar," by Mrs Mawe. I had not at that time seen very fine specimens of the *littoralis*, and it did not strike me that there was a similarity to such as I had. While in London, that excellent conchologist, Mr G. B. Sowerby, showed me a specimen precisely similar to mine, and which I think he informed me was from the collection of the veteran Humphreys. In one valve was marked in ink "Brazil;" in the other the name of the person who is supposed to have brought it from that country.

Unio semirugata. The specimen which I examined in the Duke de Rivoli's cabinet, is the one mentioned as being in Lamarck's own cabinet. It is a young *littoralis*, with rather more undulations than usual.

Unio nana. I saw this species only in the collection of Baron de Ferussac. All the specimens were old and depauperated, and their similarity to *littoralis* so great, as to induce me to believe that when better individuals are procured, they will easily be referred to that species.

Unio delodonta. The specimen cited, and which I examined in the cabinet of the Duke de Rivoli, I suspect to be the *lacteolus* (nobis). It has the beaks eroded, and therefore does not present the peculiar character of radiating folds at the point of the beaks, which is consequently omitted in Lamarck's description.

Unio sulcidens. In the Duke de Rivoli's collection—it is a compressed *complanatus* (Soland.), from the Connecticut River, where this species is more disposed to assume that character than in any river in the United States with which I am acquainted.

Unio rostrata. This is one of the numerous species made from the *pictorum* of authors. It is merely an elongated variety of that species in all the cabinets where I have seen it in Europe.

Unio Batava. This is a distinct species from *pictorum*. Baron de Ferussac thinks that Maton and Racket are entitled to the species.

Lamarck cites Schroeter first. I have not an opportunity to examine Schroeter's work.

Unio nodulosa. This is a young individual of the *ovata* of Donovan, and no doubt the specimen cited never was out of Europe. The *ovata* is emphatically an European shell, and has served, like the *pictorum*, to which it has some resemblance, to make numerous species. Lamarck's habitat (lake Champlain) is certainly an error.

Unio varicosa. The specimen described by Lamarck is still in his original cabinet. It is a young and bad specimen of the *Alasmodonta marginata* (Say). From the description I formerly supposed it to be *Alas. undulata* (Say).

Unio granosa. The only specimen of this beautiful and distinct species I saw in Europe, is in the Garden of Plants. It is unique in the possession of disks completely covered with minute granular elevations.

Unio depressa. The specimen in the Duke de Rivoli's collection is marked "from Peru," and is a very different species from one which I procured in Paris, marked by Lesson as *depressa* from New Holland. Lamarck's description is so extremely vague, that it almost equally well applies to both. The shell from Peru, of which I have several specimens, is more transverse than that from New Holland, which I presume should be considered the true *depressa*.

Unio Virginiana. This is a bad specimen of *radiatus*, in the Duke de Rivoli's collection.

Unio luteola. From the description and locality, I formerly supposed this to be Say's *cariosus*. On examining the specimen at the Garden of Plants, cited by Lamarck, I found it to be a true *siliquoides* of Barnes, which sometimes approaches the *cariosus*. There must be an error in the locality given by Lamarck, as this species does not inhabit the waters east of the Alleghany mountains. Lamarck's name has precedence to that of Mr Barnes.

Unio angusta. This is a distinct and interesting species. Its habitat is unknown, and the only specimen I have seen is in the collection at the Garden of Plants.

Unio manca. I examined the original specimen in the cabinet of

Baron de Ferussac, which Lamarck described, and I convinced the Baron that it was only a *pictorum*.

Unio cariosa. The two specimens described are both in the cabinet of the Duke de Rivoli. The first is a bad specimen of Say's *cariosus*. The other (Var. 2) is a bad specimen of the *Alasmodonta marginata* (Say). One of the habitats, Lake Erie, is an error; it is found only in our waters east of the Alleghany mountains.

Unio spuria. This species is mentioned by Lamarck as being in the museum of the Garden of Plants. I did not see it there, nor do I know it to be in any other collection.

Unio australis. The same remarks apply to this species.

Unio anodontina. I examined the individual described under this name in the collection of the Duke de Rivoli. It proved to be a specimen of *U. marginalis*, which species is yet known to inhabit only the fresh waters of India. Lamarck says it comes from Virginia, which is certainly an error.

Unio suborbiculata. This is only a *rotundata*, as mentioned before in my observations on that species.

Hyria avicularis. This is the *Mya syrmatophora* of Gronovius, Gmel., Dill., &c.: *avicularis* should therefore be abandoned. Lamarck is not certain of the habitat of his specimen, but believes it to be from Brazil. I have seen in Paris a specimen brought by Spix from that country.*

Hyria corrugata is remarkable for the folds on the umbones, and is a very distinct species.—They are both in my cabinet.

Anodonta cygnea. The well known *Mytilus cygneus* of Linnæus and others. Of the various forms of this there have been created perhaps a dozen different species.

Anodonta anatina resembles very closely the *cygnea*, but is most probably a distinct species. Poiret asserts that this species is ovipa-

* This traveller brought also the *Castalia ambigua*, which, Lamarck says, seems to be fluviatile, but which he nevertheless separates from the *Naiades*, to which it naturally belongs, and not to the family *Trigoniæ*. Both the shells are figured in Spix's beautiful work, but described with too little attention to previous writers.

rous, while the *cygnea* is viviparous. Should this prove true, they must of course be considered distinct.

Anodonta sulcata. I saw in the Duke de Rivoli's cabinet the specimen described by Lamarck. It is a variety of the *A. cygnea*, and I presume is from Europe. The *cygnea* has no analogue in the United States, with which I am acquainted.

Anodonta fragilis. Baron de Ferussac gave me a specimen of this species, brought by Monsieur Lapylaie from Newfoundland. When I first saw it in Paris, I recognized it instantly to be similar to specimens I had found in lake Skaneateles, nearly six years since, but which I had not yet published.

Anodonta rubens. This interesting species is perhaps the most ponderous of the genus. It inhabits the Nile as well as the Senegal. My specimen, from the latter river, is heavier and more inflated than those which I have from the Nile. Deshayes places it in the genus *Iridina*, asserting that the animal differs from the *Anodonta*, and is similar to that of the *Iridina*.

Anodonta crispata. This is a distinct and beautiful species, peculiar for its transverse furrows. I owe to the kindness of Baron de Ferussac the possession of this rare shell, the habitat of which is Cayenne. Lamarck says, "dans les rivières des régions australes?"

Anodonta uniopsis is a distinct species, and probably from New Holland.

Anodonta Pennsylvanica. I examined the specimen described by Lamarck. It is in the cabinet of the Duke de Rivoli, and is the same with the *undulata* of Say, *rugosus* of Swainson.

Anodonta intermedia is a variety of *anatina*. The *intermedia* of Pfeiffer is a variety of *cygnea*.

Anodonta trapezialis. The specimen described by Lamarck is in the Garden of Plants. It is the *giganteus* of Spix, who figures it in his beautiful work. Its habitat is Brazil. Lamarck says, "des eaux douces étrangères à celles de l'Europe?" It is less transverse, and has more volume than the following, which it closely resembles.

Anodonta exotica. I examined specimens of this species in the cabinets of the Duke de Rivoli, Baron de Ferussac and the Garden of Plants. Lamarck's habitat says, "les rivières de l'Inde?" I believe

it comes only from the more southern rivers of South America. My specimens, and those I saw in Europe, came from the river La Plata. It has a peculiar character, which Lamarck does not notice, in the deposit of epidermal matter at different stages of growth, with the nacre extending in waved lines, generally from one great cicatrix to the other, forming curves parallel with the palleal cicatrix.

Anodonta glauca is a distinct species, inhabiting Mexico, and figured in a recent number of Humboldt's great work.

Anodonta sinuosa. I saw the specimen described, in Baron de Ferussac's cabinet. It is very distinct, and very peculiar in the sinuous dorsal line. This species is in my cabinet.

Anodonta Patagonica. This is also a distinct and very rare species. The possession of a specimen I owe to the kindness of Mr G. B. Sowerby.

Iridina exotica. To Baron de Ferussac I owe the possession of this species. It appears to differ from the *Nilotica* in being *tuberculated* along the dorsal line, which is one of Lamarck's generic characters. The *Nilotica*, which I received from the African traveller Monsieur Cailliaud, has no crenulations along the dorsal line, but I have seen specimens on which a few could be observed. The *Clappertoni* of Denman is a young *Nilotica*.

SECOND SUPPLEMENT.

Read before the American Philosophical Society, February 7th, 1834.

UNIO SHEPARDIANUS. Plate XIII. fig. 38.

Testâ sublanceolatâ, transversissimâ, valde inæquilaterali, antice rotundatâ, postice obtuso-angulatâ, inferne emarginatâ, ad latera planulatâ; clivo umboniali elevato; valvulis subcrassis; natibus parvis, prope marginem anteriorem positis; epidermide tenebroso-fuscâ, obsolete radiatâ; dente cardinali obliquo, in valvulâ dextrâ unico, in sinistrâ duplici; dente laterali longissimo rectoque; margaritâ purpureâ et iridescente.

Shell sublanceolate, very transverse, very inequilateral, rounded before, obtusely angular behind, emarginate at base, flattened on the sides; umbonial slope elevated; valves somewhat thick; beaks small and placed near the anterior margin; epidermis dark brown with obsolete rays; cardinal teeth oblique, single in the right and double in the left valve; lateral teeth very long and straight; nacre purple and iridescent.

Hab. Hopeton, near Darien, Georgia. Professor Shepard.

My Cabinet.

Cabinet of Professor Shepard.

Diam. 1, Length 1·4, Breadth 5 inches.

Shell sublanceolate, very transverse, very inequilateral, rounded before, obtusely angular behind, emarginate at base, flattened over the umbones and sides; umbonial slope forming an oblique ridge; substance of the shell rather thick; beaks small and placed near to the anterior margin; ligament thin and long; epidermis dark brown, almost black, with obsolete rays on the more perfect individuals; cardinal teeth erect, single in the right valve and double in the left; lateral teeth very long and straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks: cavity of the beaks very shallow; cavity of the shell deep under the umbonial slope; nacre beautifully purple and iridescent.

Remarks.—This remarkable species, in its great transverseness and outline, has some resemblance to *U. Grayanus* (nobis). It is much more transverse than any species heretofore discovered from this country. The purple of the interior is like that of the *complanatus* (Soland.). In one specimen there is a muscular impression near the centre of the cavity of the shell, similar to that of the *U. trapezoides* (nobis). In another specimen there are obsolete marks of an impression. The third has none that can be distinguished.

I am indebted to the great kindness of professor Shepard of New Haven for this interesting and curious species, and it is with pleasure I dedicate it to him.

UNIO FULVUS. Plate XIII. fig. 39.

Testâ angusto-ellipticâ, inæquilaterali, transversâ, posticê subangulatâ; clivo umboniali rotundato; valvulis tenuiculis; natibus prominulis; epidermide luteâ; dente cardinali obliquo, laterali subcurvo; margaritâ salmonis colore tinctâ.

Shell narrow-elliptical, inequilateral, transverse, subangular behind; umbonial slope rounded; valves rather thin; beaks slightly elevated; epidermis yellow; cardinal teeth oblique; lateral teeth somewhat curved; nacre salmon.

Hab. . . . , South Carolina. Dr Blanding.

My Cabinet.

Cabinet of Dr Blanding.

Diam. .6, Length .9, Breadth 1.6 inches.

Shell narrow-elliptical, inequilateral, transverse, slightly inflated; umbonial slope rounded; substance of the shell rather thin; beaks slightly elevated, placed towards the anterior margin; ligament thin and rather short; epidermis yellow and yellowish brown; cardinal teeth oblique, short, disposed to be lobed, single in the right and double in the left valve; lateral teeth slightly curved, rather long; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the beaks very shallow; cavity of the shell somewhat deep; nacre salmon.

Remarks.—This species has, perhaps, most resemblance in its exterior to the *marginalis* (Lamarck), which comes from the great rivers of India. In the interior, however, it differs much. Our shell is of a very dark salmon colour. It is also a thicker shell, and the teeth are much thicker. In the colour of the epidermis it somewhat resembles the *lanceolatus* (nobis).

UNIO MODIOLIFORMIS. Plate XIII. fig. 40.

Testâ ovatâ, transversâ, inæquilaterali, inflatâ, antice angustâ, postice latâ; valvulis tenuissimis; natibus minutis et fere terminalibus; dentibus cardinalibus parvis, compressis, lateralibus longis curvisque; margaritâ subpurpureâ, valde iridescenti.

Shell ovate, transverse, very inequilateral, inflated, narrow before and broad behind; valves very thin; beaks small, nearly terminal; cardinal teeth small, compressed; lateral teeth long and curved; nacre slightly purple, very iridescent.

Hab. Santee Canal, South Carolina. Professor Ravenel.

My Cabinet.

Cabinet of Professor Ravenel.

Cabinet of P. H. Nicklin.

Diam. 1·1, Length 1·5, Breadth 2·7 inches.

Shell reversely ovate, transverse, very inequilateral, inflated, narrow before and broad behind, emarginate at basal margin; substance of the shell very thin, diaphanous; beaks small, nearly terminal, slightly undulated; ligament rather long and thin; epidermis brown, shining; rays indistinct; cardinal teeth small, compressed, disposed to be double in the left and single in the right valve; lateral teeth long, curved and elevated in their direction; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices small, situated in the cavity of the beaks; cavity of the shell deep; cavity of the beaks shallow; nacre slightly purple, very iridescent.

Remarks.—The spreading out of the posterior portion of the shell, and the narrowness of the anterior portion, is very striking in this spe-

cies. I know of no other species which has its lateral teeth so much elevated, following, as they do, the widened margin of the valve. The cardinal teeth are generally double in the left valve, but not always. They will always be found to be compressed in both valves, and generally more elevated in the right. The nacre is so very thin as to be diaphanous, and the play of iridescent colours is very beautiful. As the individual advances in age the marks of growth form large wrinkles, and it then becomes more cylindrical.

UNIO KIRTLANDIANUS. Plate XIV. fig. 41.

Testâ subrotundâ, compressâ; valvulis crassis; natibus subprominentibus; epidermide circa nates luteâ, juxta marginem fuscâ; radiis interruptis; dentibus cardinalibus subcrassis, lateralibus subcurvis brevibusque; margaritâ albâ et iridescente.

Shell rather round, compressed; valves thick; beaks somewhat elevated; epidermis yellowish about the beaks, brown towards the margin; rays interrupted; cardinal teeth rather thick; lateral teeth short and slightly curved; nacre pearly white and iridescent.

Hab. Mahoning, Ohio. J. P. Kirtland, M.D.

My Cabinet.

Cabinet of P. H. Nicklin.

Diam. 1, Length 2, Breadth 2·3 inches.

Shell rather round, compressed; substance of the shell thick, somewhat thinner behind; beaks rather elevated; ligament rather short and thick; epidermis wrinkled, dark brown, smooth and yellowish in the region of the beaks; interrupted rays pass from the beaks and are very visible over the umbones, but are lost in the wrinkles before they reach the margin; cardinal teeth rather thick; lateral teeth short, thick and slightly curved; posterior and anterior cicatrices both distinct; dorsal cicatrices situated on the under side of the cardinal teeth; cavity of the shell flat and shallow; cavity of the beaks rather deep and angulated; nacre pearly white and iridescent.

Remarks.—I owe this new species to the kindness of Dr Kirtland of

Poland, Ohio. It is very nearly allied to the *subrotundus* (nobis), and when I first received a few specimens, I doubted if it was more than a variety of that species. Subsequently receiving from the same naturalist more and better specimens, I was satisfied that it was specifically different. Specimens of the true *subrotundus* having accompanied these, it could not be, of course, a variety occasioned, as is sometimes the case, by mere locality. It differs from the *subrotundus* in being much flatter, in having smaller beaks, and in being of a darker brown—the beaks are less yellow—the rays, interrupted like that shell, tend generally nearer to the margin. In older specimens than the one figured, the posterior part becomes protruded, which gives an obliqueness to the shell.

UNIO PARANENSIS. Plate XIV. fig. 42.

Testâ subrotundatâ, inæquilaterali, compressâ; valvulis subcrassis; natibus plicatis retusis; dentibus cardinalibus recurvis, in valvulâ utrâque duplicibus; lateralibus sublongis curvisque; margaritâ albâ et iridescente.

Shell subrotund, inequilateral, compressed; valves somewhat thick; beaks folded, retuse; cardinal teeth recurved, double in both valves; lateral teeth rather long and curved; nacre pearly white and iridescent.

Hab. River Parana. Dr Burrough.

Cabinet of Dr Burrough.

Diam. 1·3, Length 3, Breadth 3·5 inches.

Shell subrotund, disposed to be pentagonal, inequilateral, compressed towards the margin, emarginate on the posterior dorsal margin; umbonial slope flattened; substance of the shell somewhat thick; beaks rather elevated, longitudinally folded, retuse; ligament rather long and thin; epidermis wrinkled, shining, greenish on the beaks and brown towards the margin, furnished with very obscure curved rays, which sweep from the beak towards the anterior part; cardinal teeth recurved, compressed, double in both valves; lateral teeth lamellar, rather long and curved; anterior cicatrices confluent; posterior cicatrices confluent;

dorsal cicatrices in the centre of the cavity of the beaks; pallear impression small and distant from the margin; cavity of the shell very shallow; cavity of the beaks small, subangular; nacre pearly white and iridescent.

Remarks.—I am indebted to the kindness of Dr Burrough for the advantage of examining and describing this interesting species. It was procured by him, during his late voyage round the world, at Buenos Ayres, having been brought from the river Parana. It is remarkable for its outline, its expanded basal margin and folded beaks.

UNIO NASHVILLIANUS. Plate XIV. fig. 43.

Testâ ellipticâ, transversâ, inæquilaterali; valvulis subcrassis; natibus prominulis et minute undulatis; dentibus cardinalibus laminatis et in valvulâ utrâque duplicibus, lateralibus subrectis; margaritâ albâ.

Shell elliptical, transverse, inequilateral; valves somewhat thick; beaks slightly elevated and minutely undulated; cardinal teeth lamelliform and double in both valves; lateral teeth nearly straight; nacre pearly white.

Hab. Cumberland River. Professor Troost.

Ohio, at Louisville. Dr Fitch.

My Cabinet.

Cabinet of Professor Troost.

Diam. .9, Length 1.4, Breadth 2.5 inches.

Shell elliptical, sometimes truncate behind, transverse, inequilateral; substance of the shell somewhat thick; beaks slightly elevated and minutely undulated at the tip; ligament rather short and straight; epidermis dark brown, obscurely rayed; cardinal teeth lamelliform, disposed to be crenulate, double in both valves; lateral teeth nearly straight, the inferior section in the left valve being enlarged towards the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks angular, rather shallow; nacre beautifully pearly white, disposed in many individuals to be pinkish on the posterior part of the shell.

Remarks.—This species has most resemblance in its general characters to the *parvus* (Barnes). It is, however, a larger shell, and in the undulations of the beaks it is very different. Like the *parvus*, the *siliquoides*, the *cariosus* and *crassus*, it is sometimes very much truncated behind. In this state it might be mistaken for a different species, did not, as in the abovementioned species, the other characters strictly identify it.

UNIO BLANDINGIANUS. Plate XV. fig. 44.

Testâ subtrapezoidê, transversâ, inæquilaterali, subinflatâ; valvulis tenuibus; natibus prominulis; dentibus cardinalibus compressis; lateralibus longis curvisque; margaritâ purpureâ.

Shell subtrapezoidal, transverse, inequilateral, somewhat inflated; valves thin; beaks somewhat prominent; cardinal teeth compressed; lateral teeth long and curved; nacre purple.

Hab. St John's river, ? Florida. Dr Blanding.

My Cabinet.

Cabinet of Dr Blanding.

Diam. .9, Length 1.5, Breadth 2.3 inches.

Shell subtrapezoidal, transverse, very inequilateral, somewhat inflated; substance of the shell thin; beaks somewhat prominent, placed near to the anterior margin; ligament rather long and narrow; epidermis fuscous, wrinkled; cardinal teeth compressed, double in the left valve and single in the right; lateral teeth long, curved and somewhat lamellar; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather deep; cavity of the beaks wide and shallow; nacre dull purple.

Remarks.—I owe to the kindness of Dr Blanding the specimens of this species which are in my cabinet. They were procured by this naturalist while in St Augustine, from an Indian whom he had directed to collect for him, and it is presumed they came from St John's river

or some of its tributaries. This species has somewhat the characters of the *obesus* (nobis), and the *complanatus* (Solander). It is not so much inflated as the former, and is more so than the latter. My oldest specimen is subemarginate on the basal margin. In all those procured by Dr Blanding, the beaks were much eroded.

UNIO CAMELUS. Plate XV. fig. 45.

Testâ subtriangulari, inæquilaterali, complanatâ per umbones a natibus usque ad marginem inferiorem; valvulis crassis; radiis sparsis capillaribusque; dente cardinali parvo, laterali magno, crasso, curvato; margaritâ albâ.

Shell subtriangular, inequilateral, flattened over the umbones from the beaks to the basal margin; valves thick; rays scattered and capillary; cardinal teeth small; lateral teeth large, thick and curved; nacre white.

Hab. Ohio river. T. G. Lea.

My Cabinet.

Diam. 1·4, Length 2·3, Breadth 3·4 inches.

Shell subtriangular, inequilateral, angular behind, flattened over the umbones from the beaks to the basal margin; substance of the shell thick; ligament thick; epidermis yellow brown, with capillary rays; cardinal teeth small; lateral teeth very large, thick and curved; anterior and posterior cicatrices both distinct; dorsal cicatrices situated on the inferior part of the cardinal teeth; cavity of the shell shallow, welted; cavity of the beaks very shallow.

Remarks.—This species seems to possess partly the characters of the *gibbosus* (Barnes), and partly those of the *planulatus* (nobis). It may be distinguished from them by its high dorsal margin, its very remarkably thick lateral tooth and its capillary rays.

UNIO GRIFFITHIANUS. Plate XV. fig. 46.

Testâ ellipticâ, expansâ, transversâ, inæquilaterali, lateribus subplanulatis; clivo umboniali rotundato; valvulis subcrassis; natibus parvis; epidermide luteolâ viridi-radiatâ; dente cardinali parvo et lobis instructo; laterali longo, curvo et ad terminum posteriorem aucto; margaritâ purpureâ, albâ, vel salmonis colore tinctâ.

Shell elliptical, spread out, transverse, inequilateral, somewhat flattened on the sides; umbonial slope rounded; valves somewhat thick; beaks small; epidermis yellowish, with green rays; cardinal teeth small, lobed; lateral teeth long, curved and enlarged at posterior end; nacre purple, salmon or white.

Hab. South Carolina. Professor Ravenel.

My Cabinet.

Cabinet of Professor Ravenel, Charleston, South Carolina.

Diam. .6, Length 1.2, Breadth 2.2 inches.

Shell elliptical, spread out, transverse, inequilateral; somewhat flattened on the sides, rounded on the umbonial slope; substance of the shell somewhat thick; beaks small, scarcely elevated; ligament somewhat long and narrow; epidermis yellowish, with green diverging rays; cardinal teeth small, lobed, disposed to be double in both valves; lateral teeth long, curved and enlarged at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated across the cavity of the beaks; cavity of the beaks rather shallow; cavity of the shell shallow; nacre purple, salmon or white.

Remarks.—Although this shell is very like the *complanatus* (Soland.), I have thought it sufficiently distinct to separate it. It is more rounded before, and more spread out, forming a more perfect ellipsis. In the nacre it is very much the same. I name it after my friend R. E. Griffith, M.D.

UNIO CONFERTUS. Plate XVI. fig. 47.

Testâ trapezoidâ, transversâ, inæquilaterali, inflatâ; valvulis subcrassis; natibus prominulis et transversim rugatis; dentibus cardinalibus compressis, et in

valvulâ utrâque duplicibus ; lateralibus longis curvisque ; margaritâ purpureâ, aut salmonis colore tinctâ.

Shell trapezoidal, transverse, inequilateral, inflated ; valves rather thick ; beaks slightly elevated and transversely wrinkled ; cardinal teeth compressed and double in both valves ; lateral teeth long and curved ; nacre purple or salmon.

Hab. Santee Canal, South Carolina. Professor Ravenel.

My Cabinet.

Cabinet of Professor Ravenel.

Diam. 1·1, Length 1·3, Breadth 2·4 inches.

Shell trapezoidal, transverse, inequilateral, inflated ; substance of the shell rather thick ; beaks slightly elevated, incurved, transversely wrinkled ; umbones very much swollen ; ligament rather short and thin ; epidermis dark brown, shining ; cardinal teeth very much compressed ; lateral teeth long and slightly curved ; anterior cicatrices distinct ; posterior cicatrices confluent ; dorsal cicatrices on the superior part of the cavity of the beaks ; cavity of the shell very deep ; cavity of the beaks full and rounded ; nacre purple or salmon.

Remarks.—The *confertus*, in its general characters, resembles the *complanatus* (Solander). It is, however, much more inflated, and differs in having teeth more compressed. The specimens in my cabinet I owe to the kindness of professor Ravenel. These are all without rays. In young specimens they may exist.

SYMPHYNOTA BENEDICTENSIS. Plate XVI. fig. 48.

Testâ trapezio simili, inæquilaterâ, transversâ, subcompressâ, margine dorsali subrectâ ; valvulis pertenuibus ; natibus subprominentibus, apicibus granulatis ; cicatricibus vix cernendis ; margaritâ cæruleo-albâ et iridescente.

Shell trapezoidal, inequilateral, transverse, rather compressed, nearly straight on the dorsal margin ; valves very thin ; beaks somewhat prominent, and granulate at tip ; cicatrices scarcely perceptible ; nacre bluish white and iridescent.

Hab. Lake Champlain.

My Cabinet.

Cabinet of Professor Benedict, Burlington, Vermont.

Diam. 1·4, Length 2·2, Breadth 3·6 inches.

Shell trapezoidal, inequilateral, transverse, rather compressed, nearly straight on the dorsal margin; substance of the shell very thin; epidermis shining, yellowish olive, with rather strong lines of growth; beaks somewhat prominent and granulate at tip; cicatrices scarcely perceptible; cavity of the beaks shallow; cavity of the disk rather shallow; nacre bluish white and iridescent.

Remarks.—On my way to Quebec, in the summer of 1829, I spent a few minutes on the shore of lake Champlain, nearly opposite to fort Ticonderoga, waiting for the steamboat. These minutes were improved in the search of the shells near the edge of the water. Among others hastily seized, was a single individual of the present species, which, though an alive specimen, was much decorticated. Unwilling to describe it as a new species, without better individuals for examination, I have endeavoured in vain to procure them until the present time. I owe to the kindness of professor Benedict a suite of different ages which verify my previous impression, and to him I dedicate the species. In outline (except the wings) it resembles the *Symphynota bi-alata* (nobis). It is not, however, so large or so thick a shell, and has neither tooth nor undulations.

ANODONTA BURROUGHIANA. Plate XVI. fig. 49.

Testâ ovatâ, valde inæquilaterali, subinflatâ; valvulis tenuibus; natibus prominulis; lineâ dorsali curvâ; margaritâ purpureâ.

Shell ovate, very inequilateral, slightly inflated; valves thin; beaks slightly elevated; dorsal line curved; nacre purple.

Hab. Island of Luconia, near Manilla. Dr Burrough.

My Cabinet.

Cabinet of Dr Burrough.

Diam. .8, Length 1.3, Breadth 2.1 inches.

Shell reversely ovate, very inequilateral, slightly inflated, rather straight on the basal margin and elevated on the posterior dorsal margin; substance of the shell thin; beaks slightly elevated; ligament long and narrow; epidermis dark brown and rather smooth; anterior and posterior cicatrices confluent; dorsal cicatrices situated in the cavity of the beaks; cavity of the shell wide and rather deep; cavity of the beaks very shallow; nacre purple.

Remarks.—To the kindness of Dr Burrough I am indebted for the privilege of describing this species. It is with pleasure I take the opportunity of placing his name upon it. It was procured by him near the city of Manilla. It resembles, in outline and colour, the *Unio cuprinus* (nobis), but has no trace of teeth. It is most remarkable perhaps for its deep colour.

MARGARITANA* RAVENELIANA. Plate XVII. fig. 50.

Testâ subcylindræâ, valde transversâ et inæquilaterali, inflatâ; valvulis tenuibus; natibus exiguis; dentibus cardinalibus parvis, subcompressis; margaritâ cœruleo-albâ.

Shell subcylindrical, very transverse, inequilateral, inflated; valves thin; beaks small; cardinal teeth small, rather compressed; nacre bluish white.

Hab. French Broad and Swananoë rivers, North Carolina.

My Cabinet.

Cabinet of Dr Ravenel.

Diam. .9, Length 1.1, Breadth 2.2 inches.

Shell subcylindrical, very transverse, inequilateral, inflated, disposed to be compressed near the basal margin, where it is often emarginate; substance of the shell thin; beaks small; ligament rather short; epidermis brown, with rays on the posterior part; umbonial slope large, rounded; cardinal teeth consisting in each valve of a small compressed

* See note at page 429, Vol. III.

lobe; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices placed under the cardinal teeth; cavity of the shell deep; cavity of the beaks shallow; nacre bluish white.

Remarks.—This species most resembles the *Alasmodonta marginata* (Say), but may be distinguished by its more cylindrical form, and its want of undulations on the posterior slope. It differs also in the roundness of the umbonial slope, and in the rays. In the *marginata* the rays are more interrupted and scattered, being sometimes quite spotted.

CYRENA ROTUNDATA. Plate XVII. fig. 51.

Testâ rotundatâ, sublenticulari, subæquilaterali, transversim rugatâ; clivo posteriori rugoso; valvulis crassis; natibus parvis, acutis, contiguis; dentibus cardinalibus subbifidis, lateralibus longis, minute serratis, rectisque; margaritâ albâ et purpureâ.

Shell round, sublenticular, nearly equilateral, transversely wrinkled, rugose on the posterior slope; valves thick; beaks small, pointed, touching; cardinal teeth disposed to be bifid; lateral teeth long, straight and minutely serrulate; nacre white and pinkish.

Hab.

My Cabinet.

Diam. 1·5, Length 2·9, Breadth 3·3 inches.

Shell round, sublenticular, nearly equilateral, transversely and rather minutely wrinkled, rugose on the posterior slope; substance of the shell thick; beaks small, pointed, touching; ligament very short and thick; epidermis yellowish brown before and dark brown behind; anterior slope furnished with a lanceolate mark formed by two curved yellow lines, which pass from the beaks to the anterior margin; posterior slope rugose, furnished with obsolete oblique folds; cardinal teeth disposed to be bifid; lateral teeth long, straight and very minutely serrulate; cicatrices scarcely perceptible; cavity of the shell rather shallow; cavity of the beaks subangular; nacre white and pinkish.

Remarks.—This beautiful and fine large species was sent to me

some years since by a dealer in Paris. It perhaps most resembles the *Zeylanica* (Lamarck). It differs, however, in being more compressed, more rotund, in having longer lateral teeth, and in these being serrulate. The nacre is rather thinner, and is coloured. On comparison it will be observed that the anterior tooth of the *Zeylanica* is merely a tubercle, while that of *rotundata* is long and lamellar. The nacre is disposed to be pinkish on the posterior part.

CYRENA JAYENSIS. Plate XVII. fig. 52.

Testâ subrotundâ, subæquilaterali, antice rugosâ; valvulis crassis; natibus parvis, elevatis; dentibus cardinalibus bifidis, lateralibus longis, minute serratis, rectisque; margaritâ purpureâ.

Shell subrotund, nearly equilateral, transversely wrinkled on the anterior part; valves rather thick; beaks small, elevated; cardinal teeth bifid; lateral teeth long, nearly straight, and minutely serrulate; nacre purple.

Hab. Batavia? J. C. Jay, M.D.

My Cabinet.

Cabinet of Dr Jay.

Diam. 1·1, Length 2·2, Breadth 2·3 inches.

Shell subrotund, nearly equilateral, furnished with transverse rather large wrinkles on the anterior part; substance of the shell rather thick; beaks small, elevated, retuse; ligament very short and thick; epidermis dark brown, shining; cardinal teeth bifid, long, nearly straight and minutely serrulate; cicatrices scarcely perceptible; cavity of the shell shallow; cavity of the beaks subangular; nacre dark purple, sometimes whitish.

Remarks.—It is to the kindness of Dr Jay I am indebted for the specimen figured. That of his cabinet is rather more oblique than this. The *Jayensis* has some resemblance to the *rotundata*, described herein, but differs in having rather large wrinkles on the anterior part, in having more elevated beaks, and in the dark purple colour of the nacre.

CYRENA TURGIDA. Plate XVIII. fig. 53.

Testâ trigonâ, inflatâ, parte anticâ turgidâ, rugosâ, inæquilaterâ, transversim rugatâ; valvulis crassis; natibus elevatis, recurvis; dentibus cardinalibus sub-bifidis, dente anteriore laterali brevi et elevato, posteriore longo et laminato; margaritâ albâ.

Shell triangular, inflated, swollen on the anterior part, rugose, inequilateral, transversely wrinkled; valves thick; beaks elevated, recurved; cardinal teeth disposed to be bifid; anterior lateral tooth short and elevated; posterior lateral tooth long and lamellar; nacre white.

Hab. . . . , India. Rev. William Carey.

My Cabinet.

Diam. 1·2, Length 1·7, Breadth 2·1 inches.

Shell triangular, inflated, swollen on the anterior part, rugose, inequilateral, transversely wrinkled; substance of the shell thick; beaks elevated, recurved; ligament rather long and narrow; epidermis yellowish brown, darker towards the margin; cardinal teeth disposed to be bifid; anterior lateral tooth short and elevated, somewhat conical; posterior lateral tooth long and lamellar; cicatrices scarcely perceptible; cavity of the shell deep and rounded; cavity of the beaks angular; nacre white.

Remarks.—To the kindness of Dr Carey of Calcutta I owe several specimens of this species. In the teeth it resembles the *C. Zeylanica* (Lamarck), and the *C. papua* (Lesson). It differs from both in being more triangular, more inflated, as well as in being a smaller species. In the enlargement of the anterior part, which seems to be turgid or swollen, it differs from any *Cyrena* with which I am acquainted. Being without serrulate teeth, it belongs to Lamarck's second division—"dents latérales entières."

CYRENA WOODIANA. Plate XVIII. fig. 55.

Testâ subtrigonâ, subinflatâ, micante, subæquilaterali, transversim rugatâ; valvulis crassis; natibus magnis et rotundatis; dentibus cardinalibus sub-bifidis, lateralibus longis, serratis, rectisque; margaritâ albâ.

Shell subtriangular, somewhat inflated, shining, nearly equilateral, transversely wrinkled; valves thick; beaks large and rounded; cardinal teeth disposed to be bifid; lateral teeth long, straight, serrulate; nacre white.

Hab. Canton. W. W. Wood.

My Cabinet.

Diam. 1·4, Length 2·4, Breadth 2·9 inches.

Shell subtriangular, obtusely angular behind, somewhat inflated, shining, nearly equilateral, transversely and rather largely wrinkled; substance of the shell thick; beaks large, rounded, not very approximate; ligament rather short and thick; epidermis blackish brown, polished, except on posterior slope; wrinkles larger near to the margin; cardinal teeth disposed to be bifid; lateral teeth long, straight, serrulate; cicatrices scarcely perceptible; cavity of the shell deep; cavity of the beaks angular; nacre white.

Remarks.—In the intenseness of colour of the epidermis, and its high polish, this species differs from any I am acquainted with. It is more inflated and less rotund than the *rotundata* herein described. Its lateral teeth are longer and not so minutely serrulate. In its triangular form it resembles the *C. papua* (Lesson). The nacre has not the clear white usual in this genus. In this specimen, below the palleal impression, it is yellowish white.

Mr Wood, to whose great kindness I owe this fine and interesting species, informed me he procured it from a boat on the river below Canton, it having been fished up by accident, when the fishermen were engaged in catching other shell fish. Owing the possession of it to him, I with great pleasure dedicate it to him.

GENUS APHRODITE (nobis).

Testâ æquivalvi, subtrigonâ, inæquilaterali; dente cardinali subnullo; dentibus lateralibus binis, sublongis; ligamento externo.

Shell equivalve, subtriangular, inequilateral; hinge with a very imperfect or no cardinal tooth; lateral teeth two, rather long; ligament external.

Remarks.—The genus *Aphrodite* is proposed for a single species which I am unable to place with any established genus. I suspect it to be an estuary shell, and should it prove so, its proper place will be after the genus *Cyrena*. The lateral teeth are placed somewhat like those in that genus, but the epidermis and substance of the shell differ entirely, being more like the genus *Mactra*.

A. COLUMBA. Plate XVIII. fig. 54.

Testâ subcompressâ, longitudinaliter et obsolete striatâ, transversim et minute rugatâ, colore columbæ tinctâ, super umbones subrufis maculis unguatis munitâ; valvulis tenuibus; natibus elevatis, acutis; dentibus cardinalibus obsolete, lateralibus binis; margaritâ luteo-albâ.

Shell rather compressed, longitudinally and obsoletely striate, transversely and minutely wrinkled, dove coloured, on the umbones furnished with reddish angular marks; valves thin; beaks elevated, pointed; cardinal teeth obsolete; lateral teeth two; nacre yellowish white.

Hab.

My Cabinet.

Diam. 1·4, Length 2·9, Breadth 3·4 inches.

Shell subtriangular, nearly equilateral, rather compressed, longitudinally and obsoletely striate, transversely and minutely wrinkled, dove coloured, furnished on the umbones with reddish angular marks; substance of the shell thin and fragile; beaks elevated, pointed, touching; ligament short and thick; epidermis thin; cardinal teeth obsolete or wanting; lateral teeth two, rather long, straight, and disposed to be

lamellar; cicatrices smooth, impressed, showing the mark of their advancement; palleal impression indistinct, broad; cavity of the shell rather shallow; cavity of the beaks angular; nacre yellowish white and shining.

Remarks.—This is certainly a very interesting shell. It is difficult to find any one to compare it with. On the inside of the anterior margin there appears to be a disposition to crenulation, caused by the longitudinal striæ. Its habitat I am not acquainted with, having purchased my specimens at a dealer's in Europe, who could not inform me from what country they came.

Io SPINOSA. Plate XIX. fig. 79.

Testâ obtuse turritâ, latâ, cornâ, sub epidermide fasciatâ, spinis magnis; anfractibus septenis; aperturâ elongatâ, dimidium longitudinis testæ habente.

Shell obtusely turrited, wide, horn colour, under the epidermis banded, furnished with large spines; whorls seven; mouth elongate, one half the length of the shell.

Hab. Holston River, Washington County, Virginia. Professor Troost.

My Cabinet.

Cabinet of Professor Troost.

Diam. 1·2,

Length 2·2 inches.

Remarks.—This species resembles very much the *Io fusiformis* (nobis), *Fusus fluviatilis* (Say), but may be distinguished by its large transversely compressed spines, the *fusiformis* having somewhat longitudinal tubercles. I am not acquainted with any fluviatile shell which has such large spines (there being about seven on each whorl), nor any which has such a general resemblance to a marine shell. Professor Troost informs me they are rare in the river, that they had been observed in the graves of the aborigines; and as it was generally be-

lieved that these were "conch shells," consequently coming from the sea, it was urged that the inhabitants who possessed them must have come over the sea. It does not appear that they had been observed in their native element, though living at the very doors of the persons who had remarked them in the tumuli.

PALUDINA BURROUGHIANA. Plate XIX. fig. 80.

Testâ turritâ, tenebroso-cornedâ, transversim striatâ, striis majoribus duabus vel tribus circiter medium anfractum; suturis profundis; anfractibus senis, valde convexis; aperturâ rotundatâ, albâ.

Shell turrited, dark horn colour, transversely striated, having two or three large striæ about the middle of the whorl; sutures very deep; whorls six, very convex: mouth round, white.

Hab. Island of Luconia. Dr Burrough.

My Cabinet.

Cabinet of Dr Burrough.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. 1·2,

Length 1·8 inches.

Operculum thin, light brown.

Remarks.—This is perhaps the largest species of *Paludina* which has yet been observed. It is remarkable for the numerous fine transverse striæ which are subgranose or undulated, and which cover, in some specimens, the whole of the whorls. About the middle of the whorls there are several larger striæ, the largest being always, in the specimens examined by me, immediately above the suture. I owe to Dr Burrough's great kindness the opportunity of describing this species. During his late voyage he procured it, with many other fine shells, from the vicinity of Manilla, in the island of Luconia.

Read before the American Philosophical Society, April 18th, 1834.

LYMNÆA ACUTA. Plate XIX. fig. 81.

Testâ elongato-turritâ, tenui, lævi, fusco-nigricante; spirâ attenuatâ; anfractibus senis; aperturâ subovatâ.

Shell elevated, turrited, thin, smooth, dark brown; spire attenuate; whorls six; aperture subovate.

Hab. pond four miles north of Philadelphia.

Diam. $\cdot 3$,

Length $\cdot 7$ of an inch.

Remarks.—This delicate species, although attenuate, is not so much so as the *exilis* herein described. Its whorls are more convex and the body whorl larger, the aperture being about one half the length of the shell. Several specimens were found by me some years since, in a very small pond near to the Falls of Schuylkill. Since then this pond has occasionally dried up, and I have not been able to find others. Although there are other ponds near to this, which other species inhabit, I have never been able to discover the *acuta* in any other spot.

LYMNÆA EXILIS. Plate XIX. fig. 82.

Testâ attenuatâ, tenuissimâ, longitudinaliter striatâ; anfractibus septenis, plano-convexis; columellâ reflexâ; aperturâ ovato-oblongâ.

Shell attenuated, very thin, longitudinally striate; whorls seven, plano-convex; columella reflected; aperture ovato-oblong.

Hab. Ohio, T. G. Lea.

My Cabinet.

Diam. $\cdot 4$,

Length 1·5 inches.

Remarks.—This is perhaps the most attenuated *Lymnæa* yet observed in this country. It approaches most to the *reflexus* (Say), but is more elongate than that species. The most remarkable character of the *exilis* is, perhaps, the reflection of its labium, which is not laid on the body of the whorl. Where it joins above with the labrum, the angle is quite acute, and is separated from the body whorl. The specimen figured was not taken alive, and the epidermis being destroyed, the description and representation are partially defective. The aperture is about two-fifths the length of the shell.

PHYSA ELLIPTICA. Plate XIX. fig. 83.

Testâ sinistrosâ, ellipticâ, tenuissimâ, pellucidâ, castaneâ, nitidâ; spirâ breviusculâ; anfractibus quaternis; labro marginato; aperturâ angustatâ.

Shell sinister, elliptical, very thin, pellucid, chesnut coloured, shining; spire rather short; whorls four; outer lip margined; aperture narrow.

Hab. T. G. Lea.

My Cabinet.

Diam. .2,

Length .5 of an inch

Remarks.—This species is less inflated and more of a chestnut colour than any I am acquainted with. Its colour is almost reddish, and the light coloured margin of the outer lip is remarkable. The aperture is rather contracted, and the whole shell somewhat elongate.

AMPULLARIA HOPETONENSIS. Plate XIX. fig. 84.

Testâ subventricosâ, lævi, superne subplanulatâ, perforatâ, luteo-fuscescente, fasciatâ; suturis impressis; anfractibus quinis; aperturâ subovatâ, albâ.

Shell subventricose, smooth, flattened above, umbilicate, yellowish-brown, banded; sutures impressed; whorls five; aperture subovate, white.

Hab. Hopeton, near Darien, Georgia. Professor Shepard.

My Cabinet.

Cabinet of Professor Shepard.

Diam. 1·4,

Length 1·7 inches.

Remarks.—I owe to the kindness of professor Shepard of New Haven this interesting shell. It was procured by him during his late geological investigations in our southern states, with other shells, descriptions of which will be found in these memoirs. It resembles the *A. fasciata* (Lam.), but is less globose, the whorls of our species being somewhat flattened on the side and top. It differs from the *A. depressa* (Say), described in major Long's expedition to St Peter's river (subsequently changed to *A. paludosa* in the Disseminator), in being less globose, and in being flatter on the side and superior part of the whorls.

PALUDINA GEORGIANA. Plate XIX. fig. 85.

Testâ ventricosô-conoideâ, tenui, tenebroso-corneâ, lævi; suturis valde impressis; anfractibus instar quinis, convexis; aperturâ subrotundatâ, albâ.

Shell ventricosô-conical, thin, dark horn coloured, smooth; sutures very much impressed; whorls about five, convex; aperture nearly round, white.

Hab. Hopeton, near Darien, Georgia. Professor Shepard.

My Cabinet.

Cabinet of Professor Shepard.

Diam. ·7,

Length 1·1 inches.

Remarks.—This species, in form, resembles most, perhaps, the *P. vivipara*. It is not quite so large, nor has it bands. It is rather more elevated, and the body whorl is smaller and rounder than the *P. decisa* (Say). The aperture at the base recedes more than is usual with this genus.

SUCCINEA RETUSA. Plate XIX. fig. 86.

Testâ ovato-oblongâ, tenuissimâ, pellucidâ, flavidulâ; spirâ brevi; anfractibus ternis; aperturâ inferne dilatâtâ et retractâ.

Shell ovately oblong, very thin, pellucid, yellowish; spire short; whorls three; aperture below dilate and drawn back.

Hab. Ohio, near Cincinnati. T. G. Lea.

Diam. .3,

Length .7 of an inch.

Remarks.—A single specimen only of this species has come into my possession. It differs so much from any of the described species, in the dilatation and retraction of the inferior part of the aperture, that I have not hesitated to consider it new.

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OF

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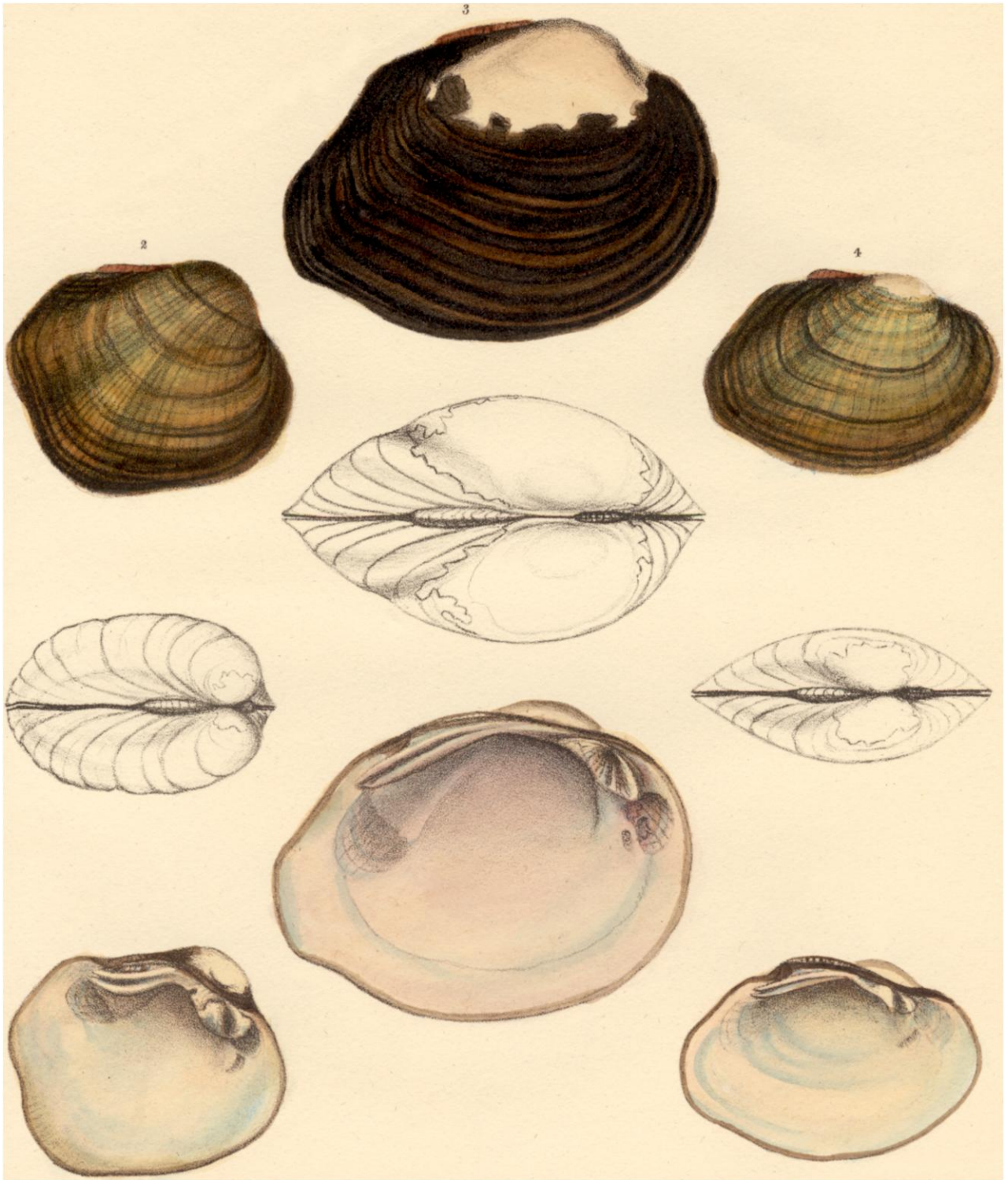
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subrotundus	-	-	IV. 117	purpuragula	-	V. 51
Taitianus	-	-	V. 39	vesica	-	V. 56
trapezoides	-	-	IV. 69	Woodiana	-	V. 57
trigonus	-	-	IV. 110	Carocolla Helicoides	-	IV. 103
Troostensis	-	-	V. 71	spinosa	-	IV. 104
varicosus	-	-	IV. 90	Helicina lens	-	V. 49
zig-zag	-	-	III. 440	pulcherrima	-	V. 49
Anodonta Blainvilliana	-	-	V. 77	virginea	-	V. 50
Burroughiana	-	-	V. 105	Achatina Vanuxemensis	-	V. 84
Ferussaciana	-	-	V. 45	Succinea retusa	-	V. 117
incerta	-	-	V. 46	Auricula fuscagula	-	V. 83
lato-marginata	-	-	V. 76	Cyclostoma striata	-	V. 84
Mortoniana	-	-	V. 80	Physa elliptica	-	V. 115
plana	-	-	V. 48	Lymnæa acuta	-	V. 114
Stewartiana	-	-	V. 47	exilis	-	V. 114
tenebricosa	-	-	V. 78	imperialis	-	V. 81
Margaritana Raveneliana	-	-	V. 106	Melania aculeus	-	V. 81
Symphynota alata	-	-	III. 448	acuta	-	IV. 101
Benedictensis	-	-	V. 104	elongata	-	IV. 120
bi-alata	-	-	III. 445	subularis	-	IV. 100
bi-lineata	-	-	IV. 98	tuberculata	-	IV. 101
compressa	-	-	III. 450	Io fusiformis	-	IV. 122
cygnea	-	-	III. 456	spinosa	-	V. 112
complanata	-	-	III. 448	Melanopsis maculata	-	V. 82
discoidea	-	-	V. 75	princeps	-	V. 82
globosa	-	-	V. 41	Paludina bi-monilifera	-	V. 58
gracilis	-	-	III. 452	Burroughiana	-	V. 113
inflata	-	-	IV. 99	Georgiana	-	V. 116
lævissima	-	-	III. 444	Ampullaria Hopetonensis	-	V. 115
magnifica	-	-	V. 43			



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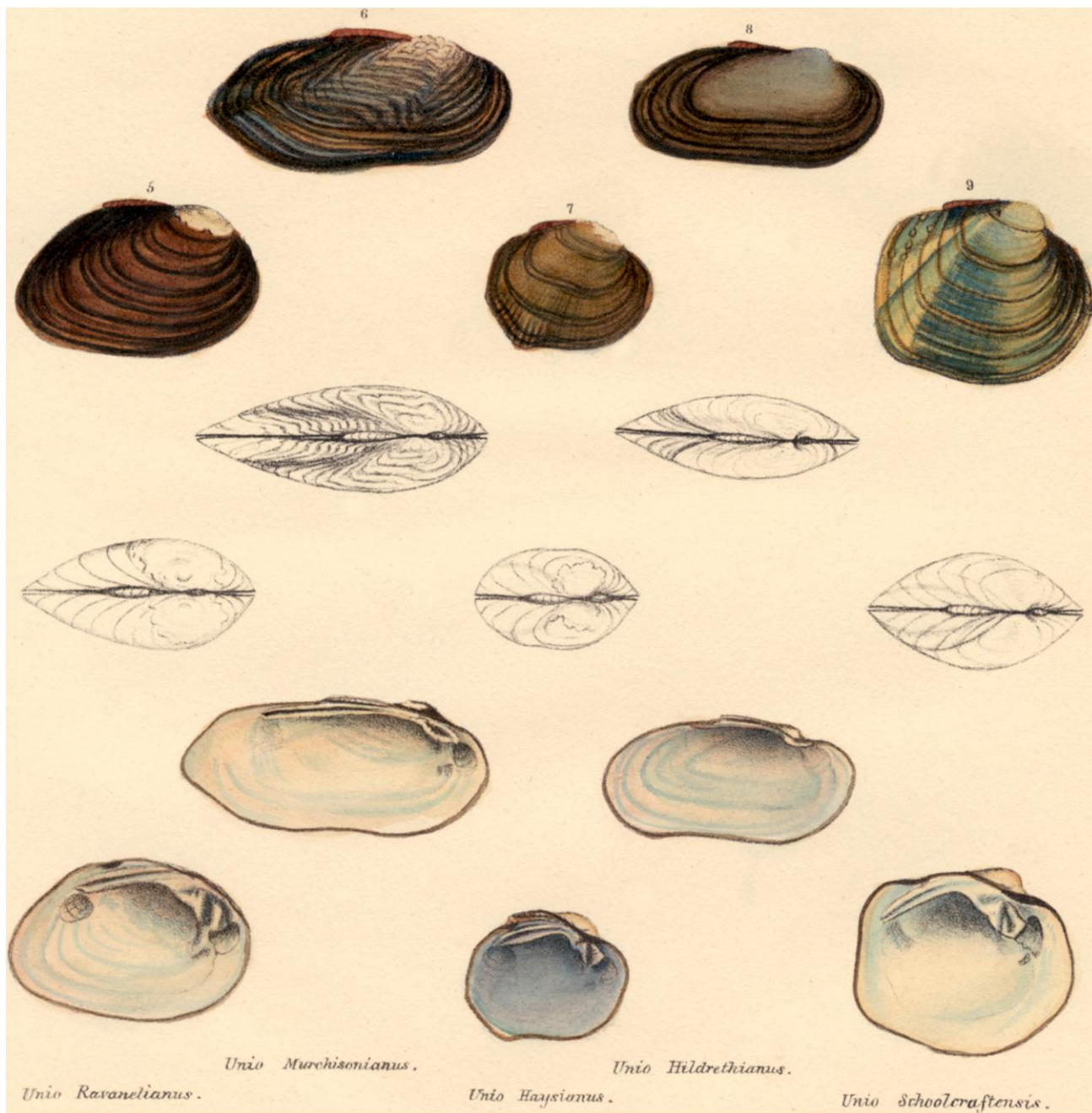
Unio Nicklinianus

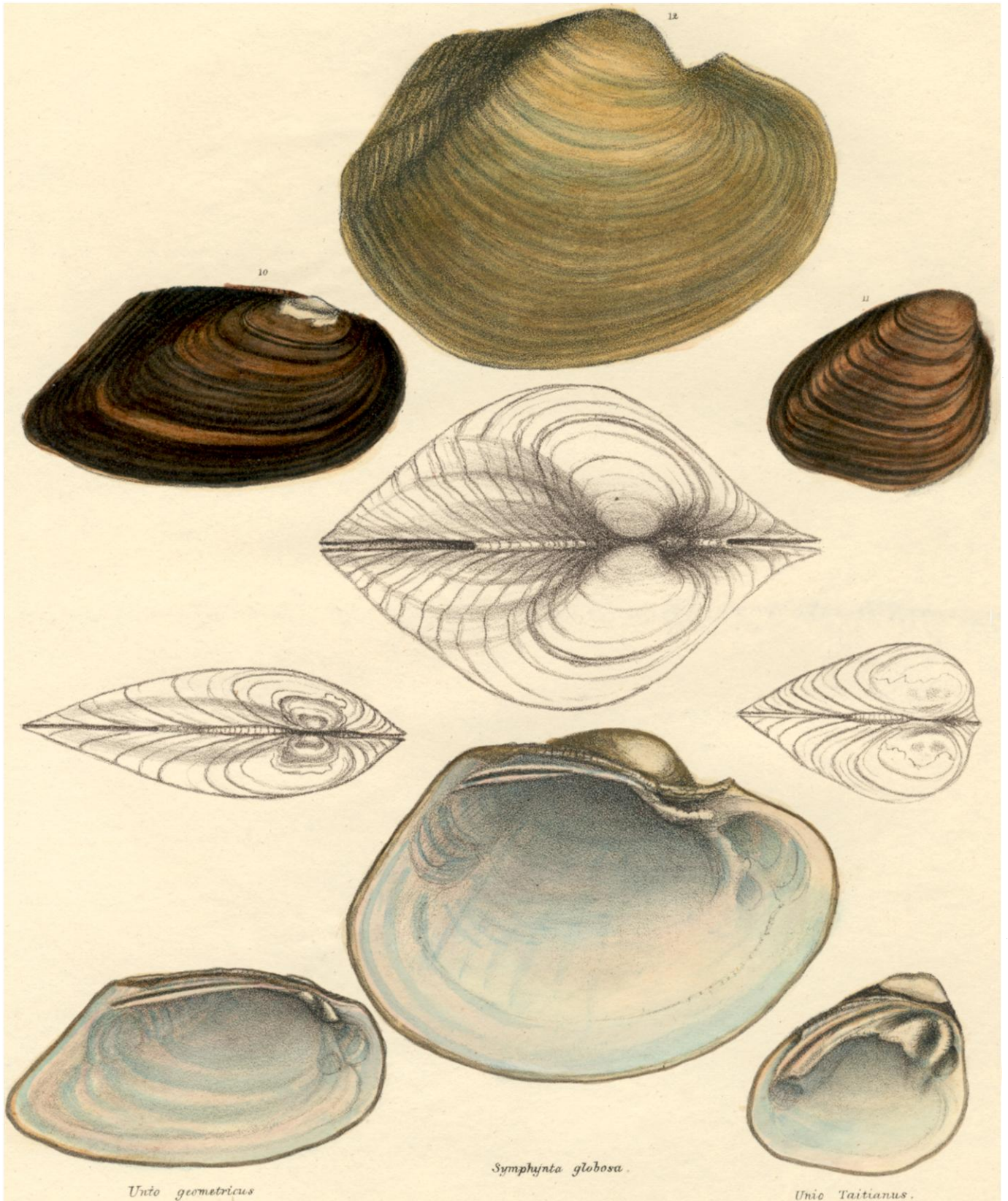


Unio capillaris.

Unio subglobosus.

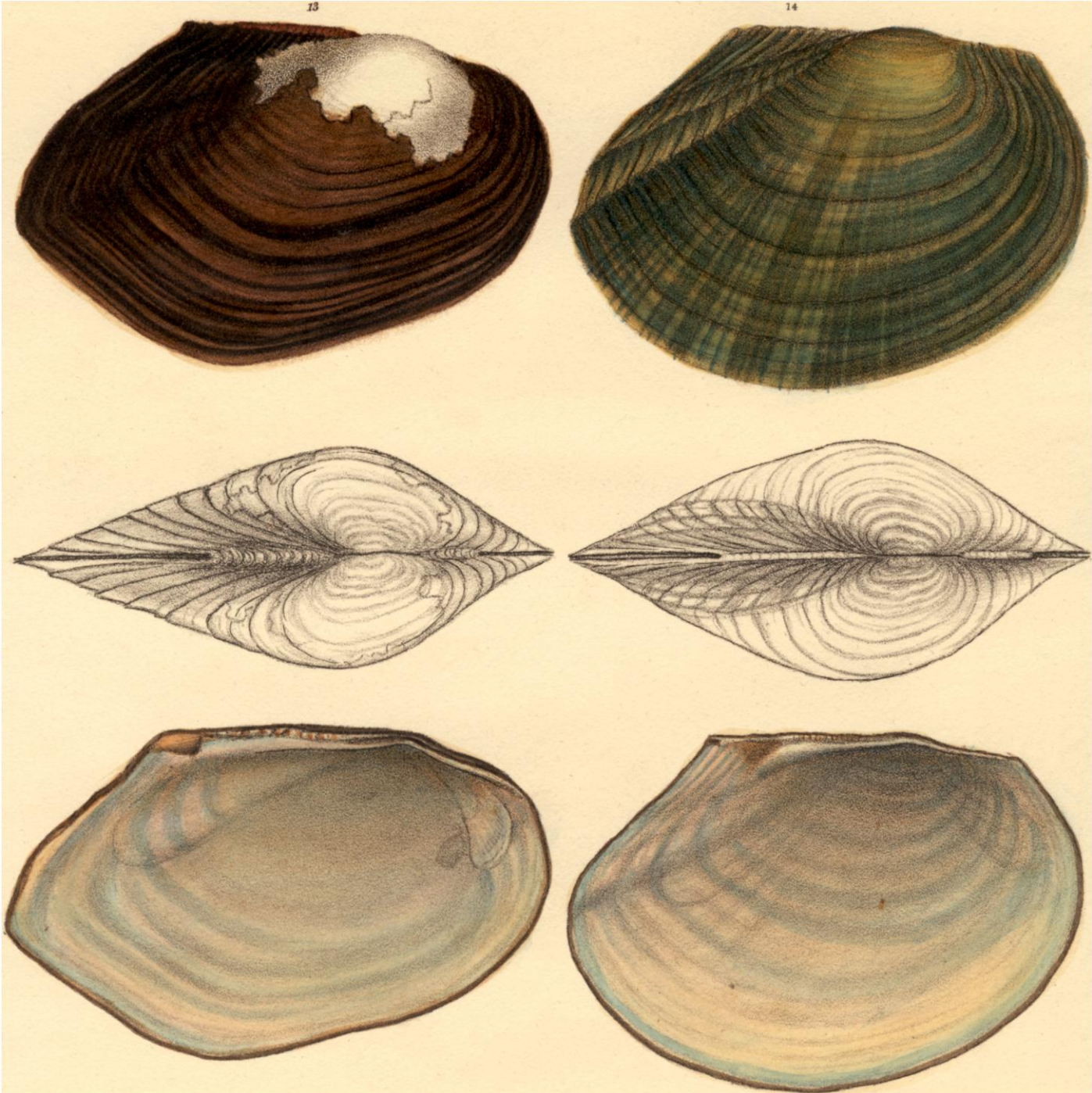
Unio capsæformis.





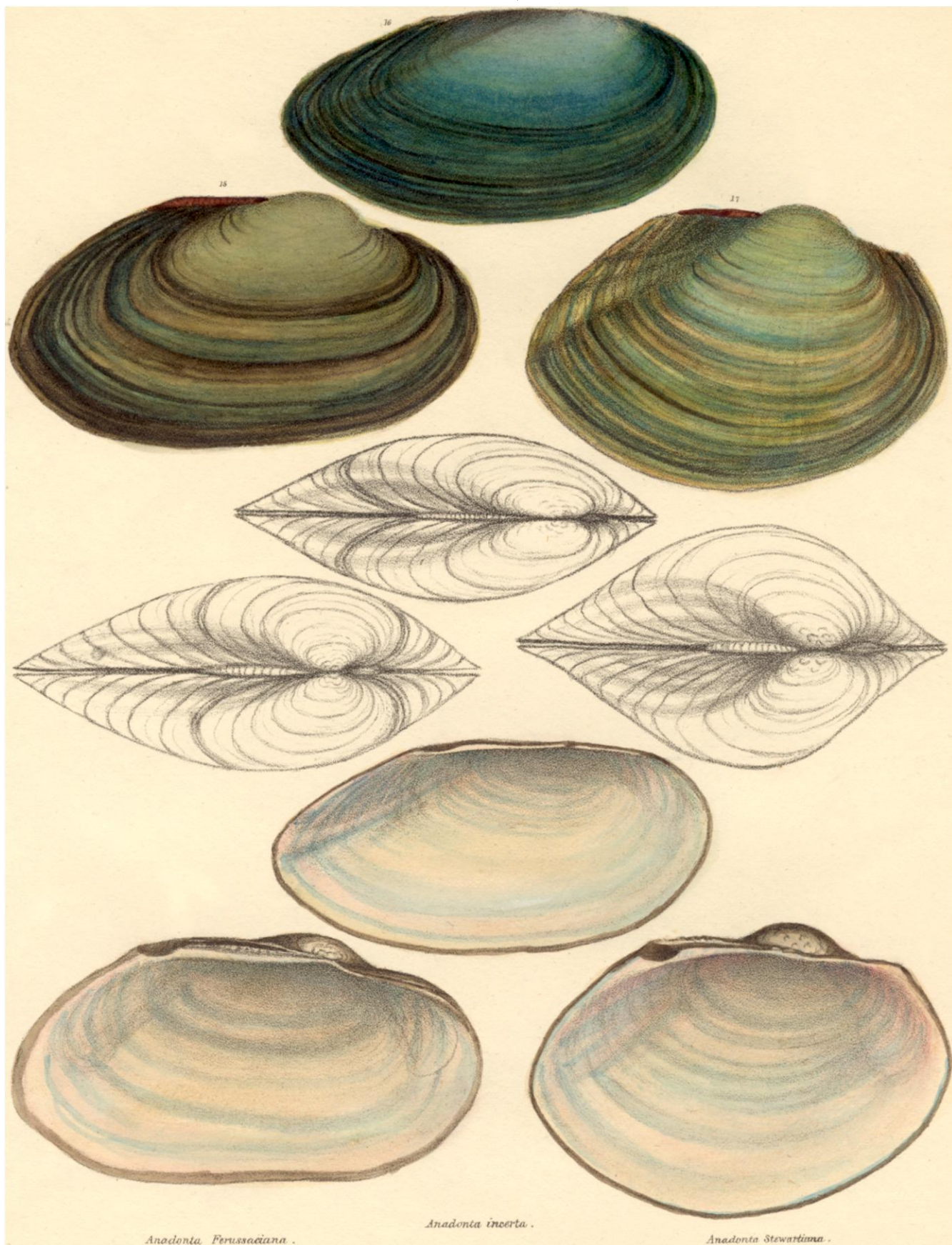
13

14



Symphynota Woodiana.

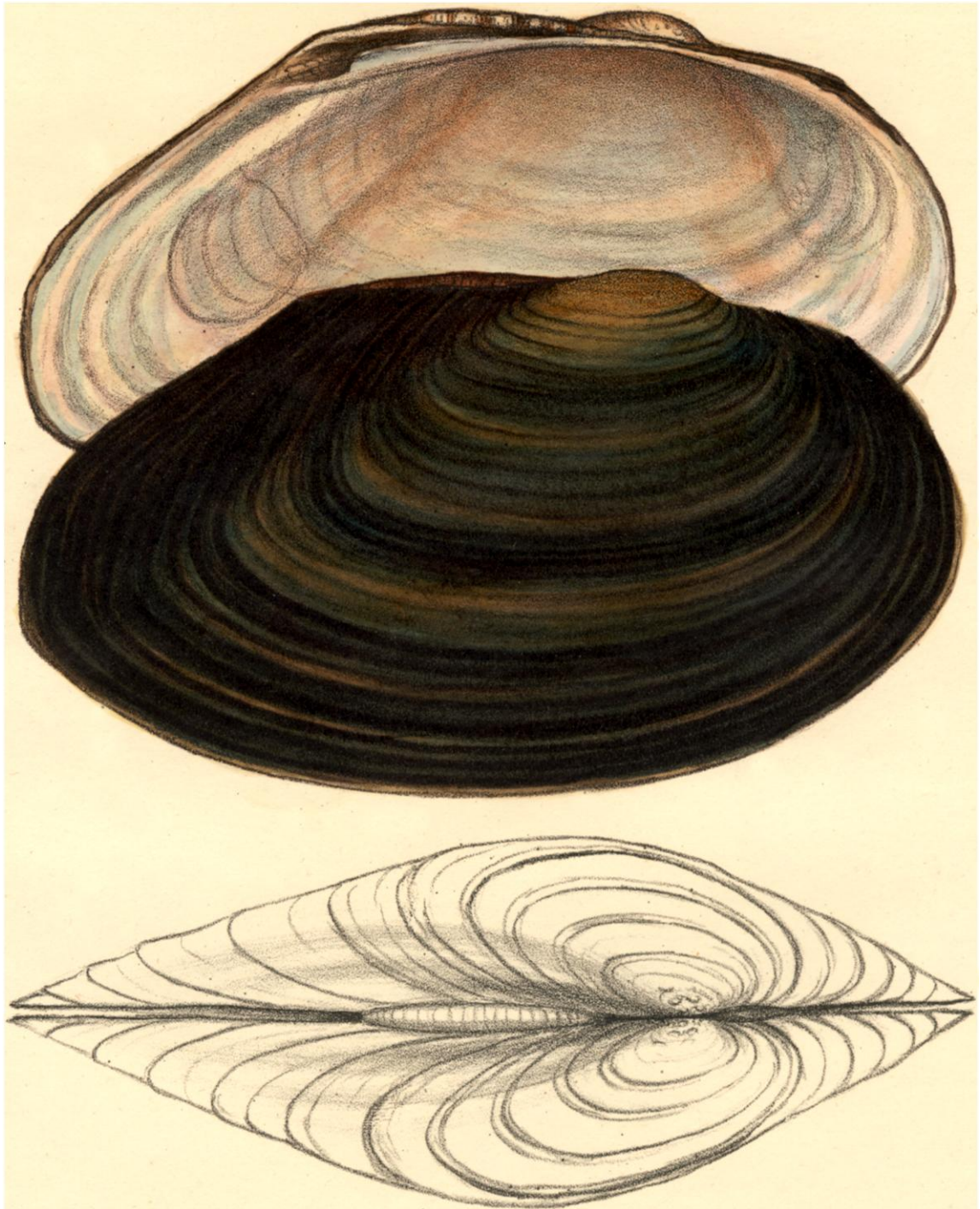
Symphynota magnifica.



Anadonta Ferussaciana.

Anadonta incerta.

Anadonta Stewartiana.



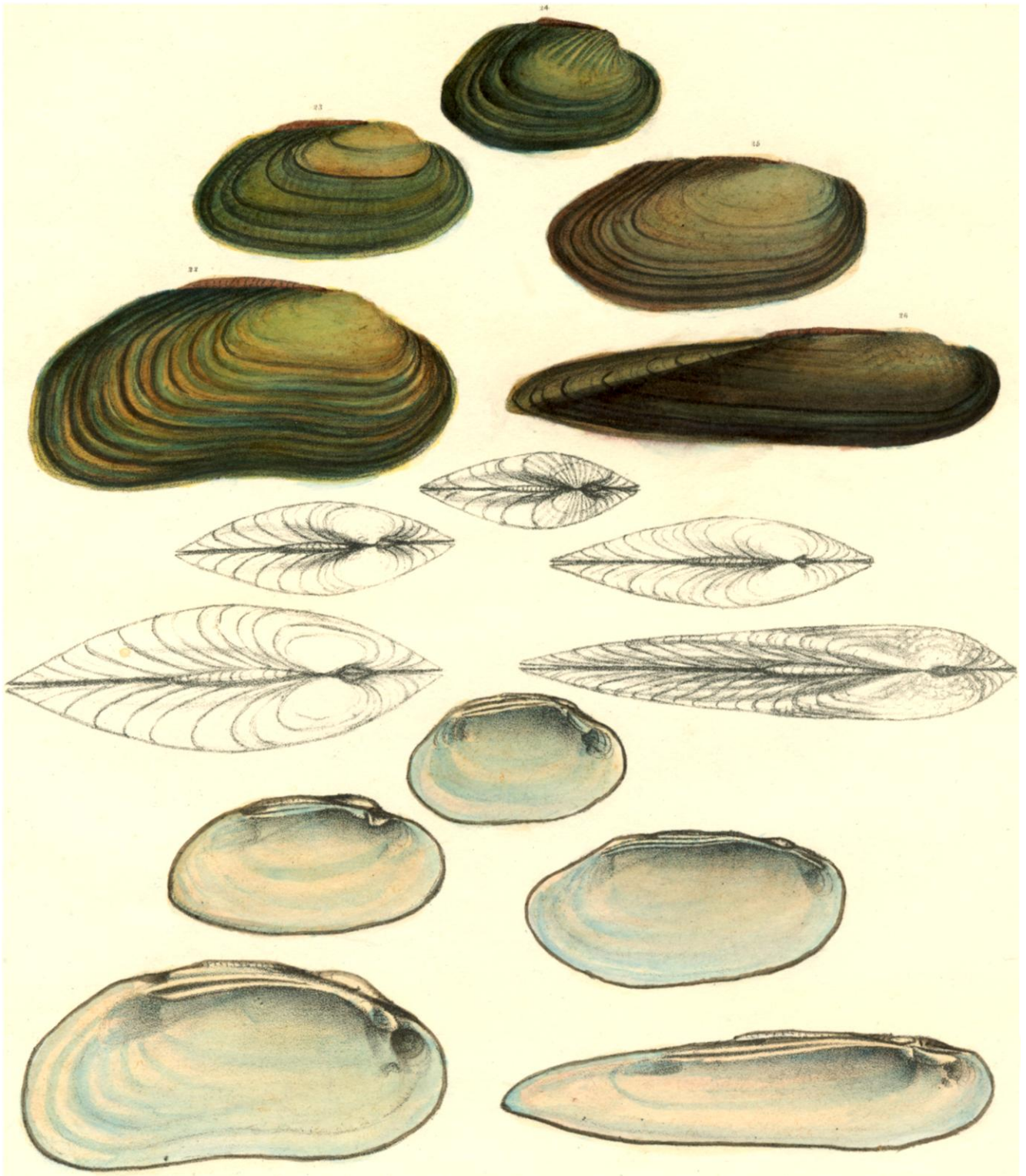
Anadonta plana.



Unio parallelopedon.

Unio lacteolus.

Unio Cooperianus.



Unio emarginatus.

Unio divaricatus.

Unio Grayanus.

Unio Conradicus.

Unio Corrianus.



Unio Sowerbianus.

Unio dromas.

Unio Burroughianus.

Unio Troostensis.







35 *Unio Shepardianus*.

39 *Unio fulvus*.

Anodonta Mortoniana.

Unio modioliformis.

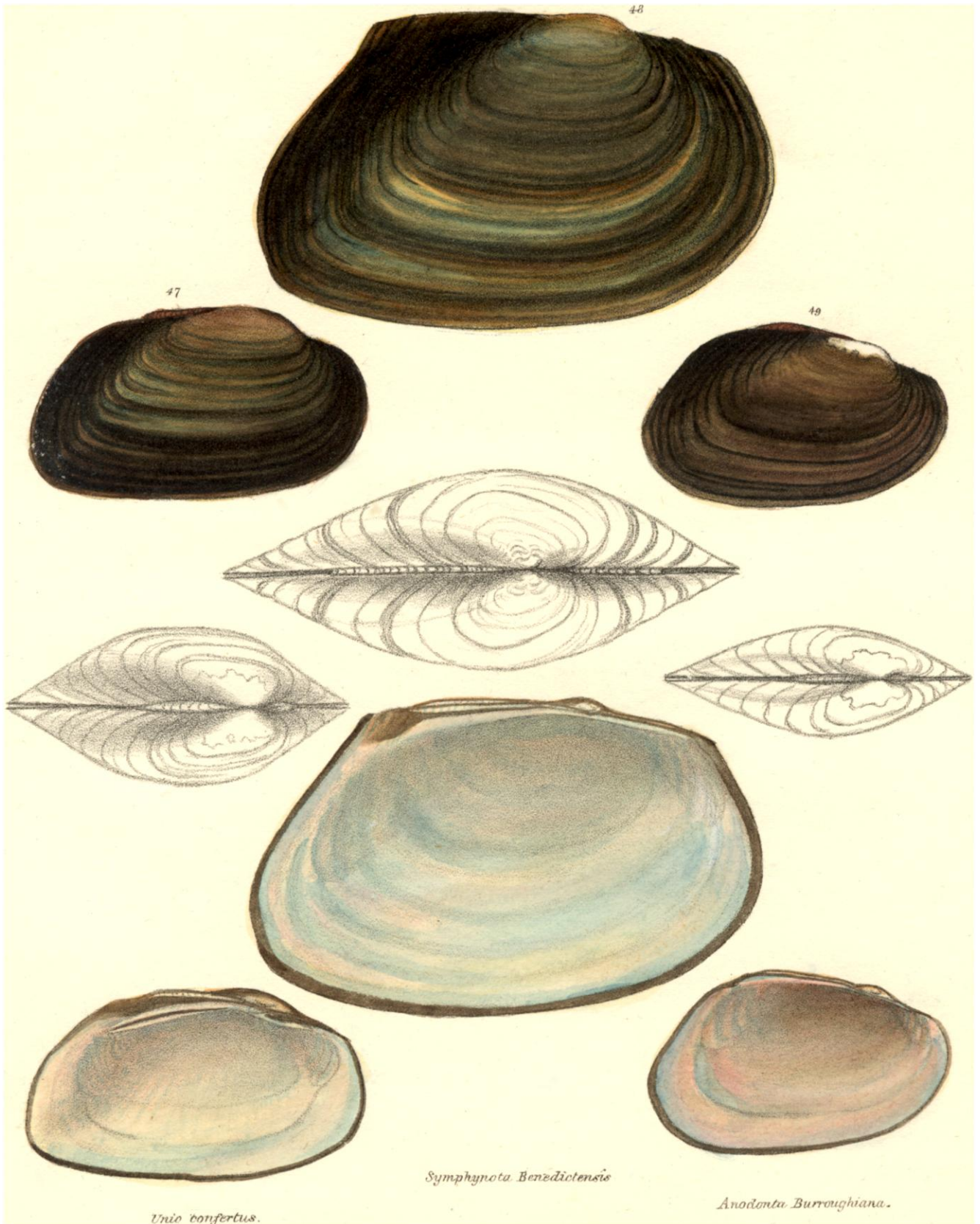




Unio Blandingianus.

Unio camelus.

Unio Griffithianus.

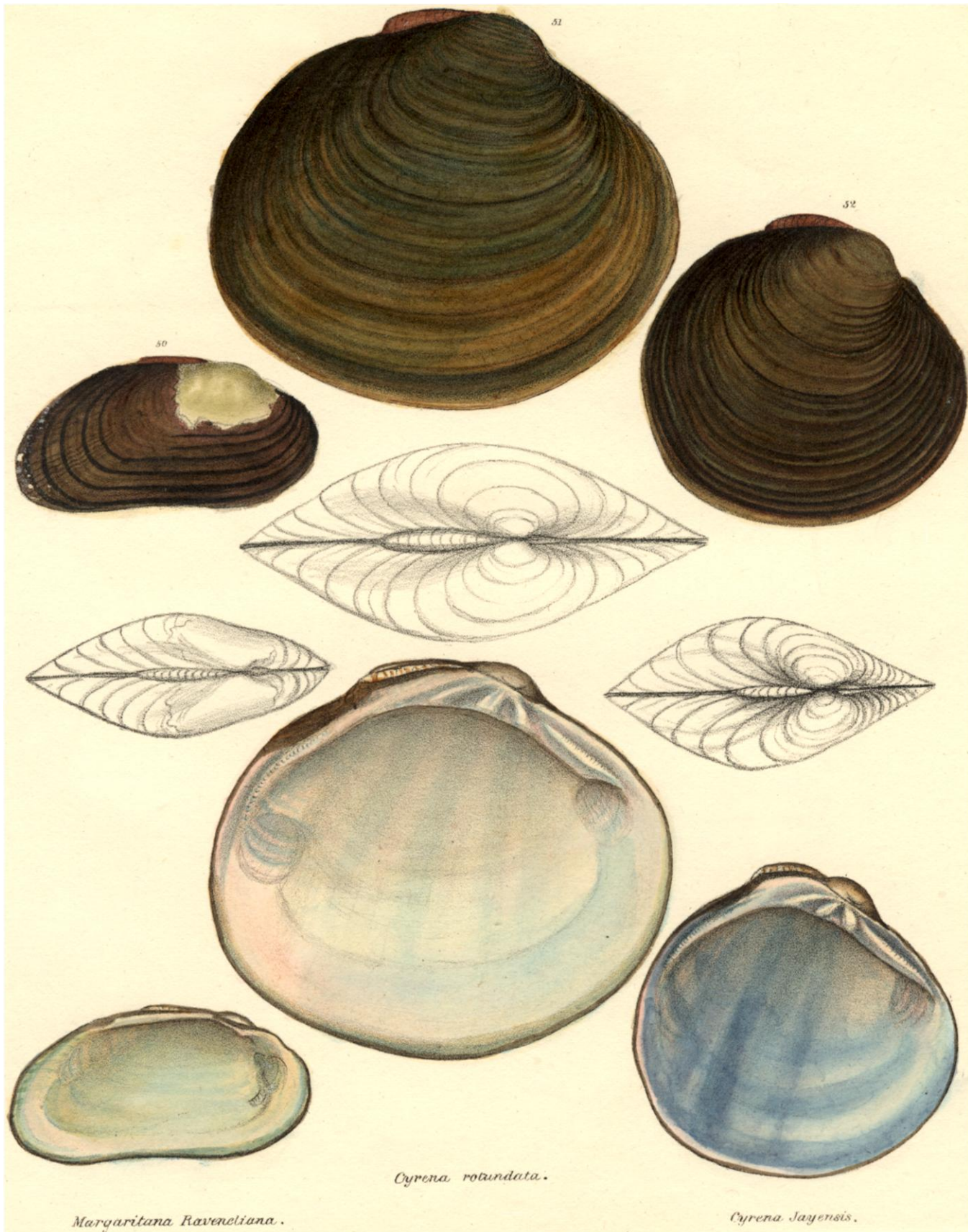


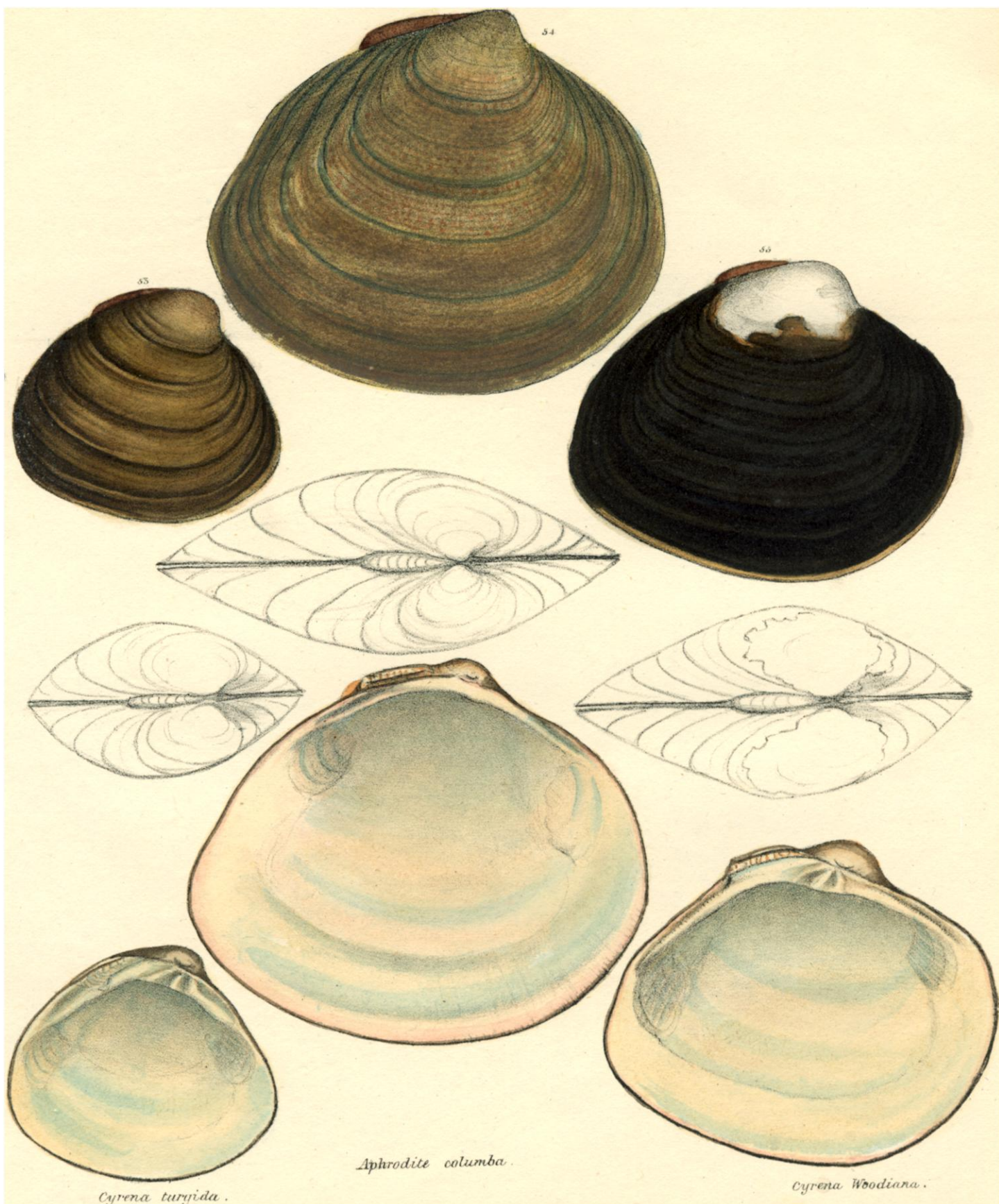
Unio confertus.

Symphynota Benedictensis

Anodonta Burroughiana.

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Cyrena turrida.

Aphrodite columba.

Cyrena Woodiana.



56 *Helix* *lens*
 57 " *pulcherrima*
 58 " *virginea*
 59 *Helix* *muscurum*
 60 " *purpuragula*
 61 " *ovum reguli*
 62 " *monodonta*
 63 " *cyclostomopsis*

64 *Helix* *mamilla*
 65 " *diaphana*
 66 " *Himalana*
 67 " *vestia*
 68 " *cineta*
 69 " *Woodiana*
 70 " *globula*
 71 *Paludina* *hi-monilefera*

72 *Melania* *aculeus*
 73 *Lymnaea* *imperialis*
 74 *Melanopsis* *princeps*
 75 " *maculata*
 76 *Auricula* *nuscagula*
 77 *Cyclostoma* *striata*
 78 *Achatina* *Varuemenensis*
 79 *Io* *spinosa*

80 *Paludina* *Burroughiana*
 81 *Lymnaea* *acuta*
 82 " *exilis*
 83 *Physa* *elliptica*
 84 *Ampullaria* *Hopetonensis*
 85 *Paludina* *Georgiana*
 86 *Succinea* *reticulata*